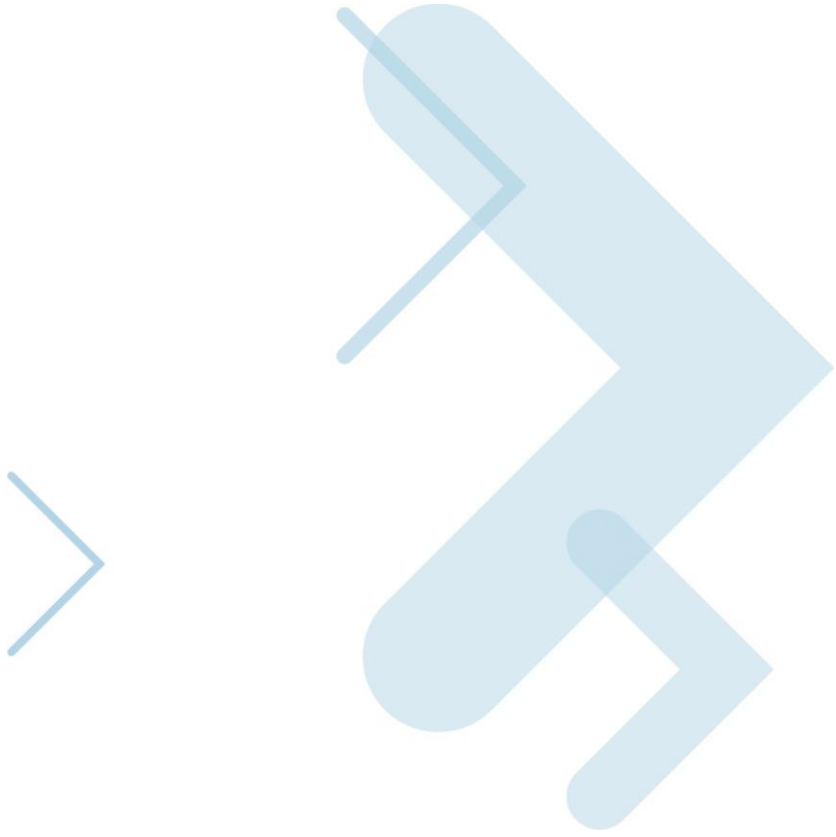
# *Compal Broadband Networks*

CH6643E Wireless Gateway Series

User Guide



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# 1 Overview

The CBN CH6643E Wireless Gateway is designed for your home, home office, or small business/enterprise. It can be used in households with one or more computers capable of wireless connectivity for remote access to the wireless gateway.

This user guide provides product overview and setup information for the CH6643E. It also provides instructions for installing the wireless gateway and configuring the wireless LAN, Ethernet, router, DHCP, and security settings.

## Contact Information

- For any questions or assistance with the CH6643E Wireless Gateway, contact your Internet Service provider.
- For information on customer service, technical support, or warranty claims; see the CBN CH6643E Software License, Warranty, Safety, and Regulatory Information card provided with the CH6643E Wireless Gateway.

## Standard Features

The CH6643E Wireless Gateway combines high-speed Internet access, networking, and computer security for a home or small-office LAN. It offers the following features:

- Combination of five separate products in one compact unit — an EURO DOCSIS® 3.0 cable modem, IEEE 802.11b/g/n wireless access point, Ethernet 10/100/1000 Base-T connections, two VoIP Internet telephone connections, and firewall.
- An integrated high-speed cable modem for continuous broadband access to the Internet and other online services with much faster data transfer than traditional dial-up or ISDN modems.
- Advanced firewall for enhanced network security from undesired attacks over the Internet. It supports stateful-inspection, intrusion detection, DMZ, denial-of-service attack prevention, and Network Address Translation (NAT).
- One broadband connection for up to 253 computers to surf the web; all computers on the LAN communicate as if they were connected to the same physical network.
- Four 10/100/1000Base-T Ethernet uplink ports supporting half- or full-duplex connections with auto-MDIX capability.
- An IEEE 802.11n wireless access point to enable laptop users to remain connected while moving around the home or small office or to connect desktop computers without installing network wiring. Depending on distance, wireless connection speeds can vary.
- CH6643E wireless function supports Wi-Fi 2.4G and 5G dual-band mode. You can either select 2.4G or 5G single mode or select dual-band concurrent mode to adapt to a wide variety of environment.

- A secure Wireless Fidelity (Wi-Fi) broadband connection for Wi-Fi enabled devices on your network, such as your cellular telephone, laptops, printers, PDAs, and desktops.
- Routing for a wireless LAN (WLAN) or a wired Ethernet LAN; you can connect more than four computers using hubs and/or switches
- A built-in DHCP server to easily configure a combined wired and/or wireless Class C private LAN.
- Virtual private network (VPN) pass-through operation supporting IPSec, PPTP, or L2TP to securely connect remote computers over the Internet.
- CH6643E Configuration Manager (CMGR) which provides a graphical user interface (GUI) for easy configuration of necessary wireless, Ethernet, router, DHCP, and security settings.
- USB 2.0 host port is provided to support print server and network storage function with FTP server and Samba server which file system supported are FAT16, FAT32, and NTFS. You can plug in an USB memory stick then access it via FTP client or Windows Explorer.

# CH6643E LAN Choices

You can connect up to 253 client computers to the CH6643E using one or any combination of the following network connections:

- Wi-Fi wireless LAN (WLAN)
- Ethernet local area network (LAN)

## Wireless LAN

Wireless communication occurs over radio waves rather than a wire. Like a cordless telephone, a WLAN uses radio signals instead of wires to exchange data. A wireless network eliminates the need for expensive and intrusive wiring to connect computers throughout the home or office. Mobile users can remain connected to the network even when carrying their laptop to different locations in the home or office.

Each computer or other device on a WLAN must be Wi-Fi enabled with either a built-in or external wireless adapter.

**Laptops** — Use a built-in wireless notebook adapter, a wireless PCMCIA slot adapter, or a wireless USB adapter.

**Desktops** — Use a wireless PCI adapter, wireless USB adapter, or compatible product in the PCI slot or USB port, respectively.

**Sample Wireless Network Connections (CH6643E model shown)**

Your maximum wireless operation distance depends on the type of materials through which the signal must pass and the location of your CH6643E and clients (stations). CBN cannot guarantee wireless operation for all supported distances in all environments.

> ***Note**: To get better wireless coverage, please put your CH6643E wireless gateway vertically.*

## Wired Ethernet LAN

You can easily connect any PC with an Ethernet cable to the CH6643E Ethernet port. Because the CH6643E Ethernet port supports auto-MDIX, you can use a straight-through or cross-over cable to connect a hub, switch, or computer. Use category 5, or better, cabling for all Ethernet connections.

**Sample Ethernet to Computer Connection (CH6643E model shown)**

A wired Ethernet LAN with more than four computers requires one or more hubs, switches, or routers. You can:

- Connect a hub or switch to any Ethernet port on the CH6643E.
- Use Ethernet hubs, switches, or routers to connect up to any combination of 253 computers and wireless clients to the CH6643E.

More detailed information on Ethernet cabling is beyond the scope of this document.

# Front Panel

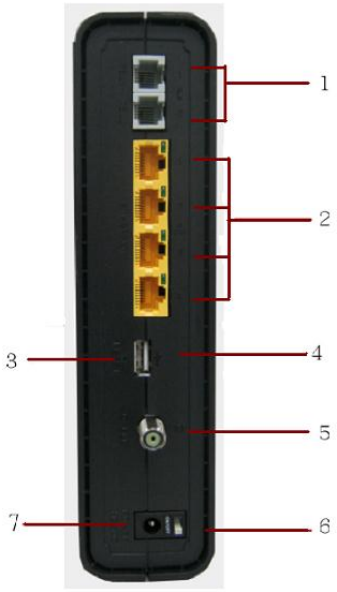
The CH6643E front panel contains indicator lights and the **WPS button** which is used to configure Wi-Fi Protected Security (WPS) on compatible clients connected to the CH6643E network.

The CH6643E front panel LED indicators provide the following status information for power, communications, and errors:

| | LED | Flashing | On |
|---|---|---|---|
| 1 | **POWER** | Not applicable — LED does not flash | **Green**: Power is properly connected |
| 2 | **RECEIVE** | Scanning for a downstream channel connection | **Green**: Downstream channel is connected<br>**Blue**: Downstream channel is connected with bonded channels |
| 3 | **SEND** | Scanning for an upstream channel connection | **Green**: Upstream channel is connected<br>**Blue**: Upstream channel is |

| | LED | Flashing | On |
|---|---|---|---|
| | | | connected with bonded channels |
| 4 | **ONLINE** | Scanning for Internet connection; transmitting or receiving data over the Internet | **Green**: Connected to Internet |
| 5 | **TEL1**<br>**TEL 2** | Telephone is off-hook; dialing or call in progress | **Green**: Telephone is connected and activated; on-hook |
| 6 | **WIRELESS** | **Amber**: WPS function is enabled. | **Green**: Wi-Fi wireless interface is active now. |

# Rear Panel




The CH6643E (shown above) rear panel contains the following cabling port and connectors:

| | Item | Description |
|---|---|---|
| 1 | **TEL 1**<br>**TEL 2** | VoIP connection for a single telephone. Two sets of telephone can be supported. |
| 2 | **ETHERNET**<br>**1 2 3 4** | Use any Ethernet port to connect an Ethernet-equipped computer, hub, bridge, or switch using an RJ-45 cable.<br><br>**Activity LED** - Green LED defines the activity of the Ethernet connector.<br>When LED is ON, this indicates that there is no data traffic and a connection is stabilized.<br>When LED is FLASHING, this indicates that there is data being |

| | Item | Description |
|---|---|---|
| | | transmitted upstream or downstream.<br>When LED is OFF, this indicates that the unit is not powered or there is no Ethernet connection. |
| 3 | **RESET** | Press and hold the RESET button for five seconds or longer to restore CH6643E to factory default settings. After factory default settings are restored, the gateway will restart and may take 5 to 30 minutes to find and lock on the appropriate communication channels. |
| 4 | **USB** | USB host port for print server or network storage function |
| 5 | **CABLE** | Connect the CH6643E to a cable wall outlet. |
| 6 | **POWER SWITCH** | Switch gear for power on/off the CH6643E. |
| 7 | **POWER** | Provide power to the CH6643E. |

# MAC Label

The CH6643E Media Access Control (MAC) label is located on the bottom of the CH6643E. The label contains the MAC address which is a unique, 48-bit value that identifies each Ethernet network device. To receive data service, you will need to provide the MAC address marked **HFC MAC ID** to your Internet Service provider."

Note: Label may differ according to local settings or requirements.

# 2 Getting Started

## Inside the Box

Before you install the CH6643E Wireless Gateway, verify that the following items are included in the box with the CH6643E:

| Item | Description |
|---|---|
| **Power cord** | Connects the CH6643E to an AC electrical outlet |
| **Software License & Regulatory Card** | Contains software license, warranty, and safety information for the CH6643E. |
| **CH6643E Install Sheet** | Provides basic information for setting up the CH6643E |

You must have the latest service packs and patches installed on your computer for your operating system.

You will need a 75-ohm coaxial cable with F-type connectors to connect the CH6643E to the nearest cable outlet. If a TV is connected to the cable outlet, you may need a 5 to 900 MHz RF splitter and two additional coaxial cables to use the TV and the CH6643E.

# Before You Begin

Take the following precautions before installing the CH6643E:

- Postpone installation until there is no risk of thunderstorm or lightning activity in the area.
- To avoid potential shock, always unplug the power cord from the wall outlet or other power source before disconnecting it from the CH6643E rear panel.
- To prevent overheating the CH6643E, do not block the ventilation holes on the sides of the unit. Do not open the unit. Refer all service to your Internet Service provider.

Check that you have the required cables, adapters, and adapter software. Verify that the proper drivers are installed for the Ethernet adapter on each networked computer. For information on WLAN setup, see Setting Up Your Wireless LAN.

## System Requirements

Your computer must meet the following minimum requirements:

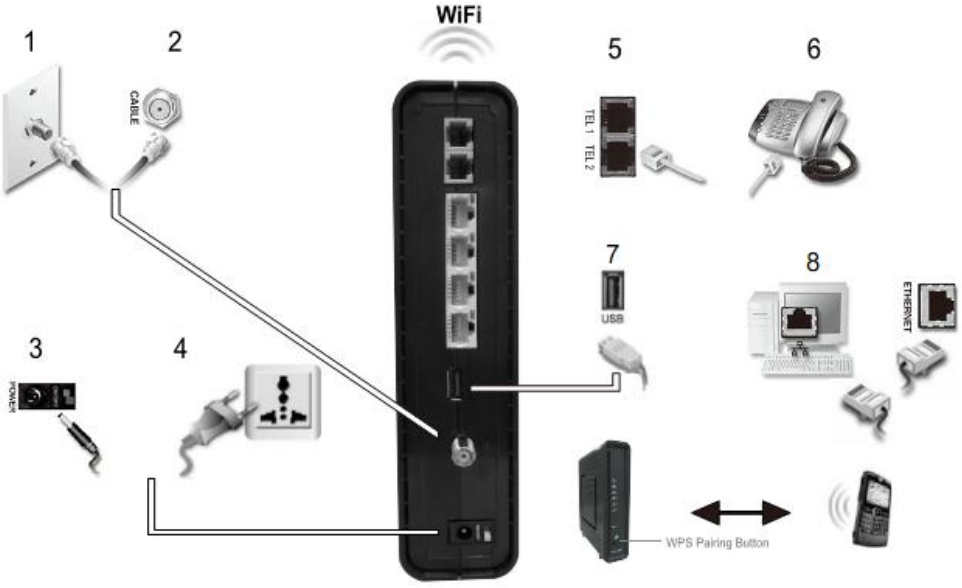
- Computer with Pentium© class or better processor
- Windows XP, Windows Vista, Macintosh, or UNIX operating system with available operating system CD-ROM
- Any web browser, such as Microsoft Internet Explorer, Netscape Navigator®, or Mozilla® Firefox®

# Connecting the CH6643E

Before starting, be sure the computer is turned on and the CH6643E power cord is unplugged.

1. Connect one end of the coaxial cable to the cable outlet or splitter.
2. Connect the other end of the coaxial cable to the Cable connector on the CH6643E. Hand-tighten the connectors to avoid damaging them.
3. Plug the power cord into the Power port on the CH6643E.
4. Plug the other end of the power cord into an electrical wall outlet.

   This automatically powers on the gateway. You do not need to unplug the gateway when it is not in use. The first time you plug in the CH6643E, allow it 5 to 30 minutes to find and lock on the appropriate communications channels.
5. Plug the other end of the telephone cord of a single or two-line telephone into the TEL 1/2 port on the rear of the CH6643E.
6. Plug the telephone cord of a single or two-line telephone into the telephone.
7. (optional step) Plug USB memory stick or hard-disk drive into USB port on CH6643E.
8. Connect the Ethernet cable to the Ethernet port on the computer, and connect the other end of the Ethernet cable to the Ethernet port on the gateway.




9. For a second telephone, plug the telephone wire of a single-line telephone into the TEL 2 port on the rear of the CH6643E.
10. Check that the LEDs on the front panel cycle through the following sequence:

**CH6643E LED Activity During Startup**

| LED | Description |
|---|---|
| **POWER** | Turns on when AC power is connected to the CH6643E.<br>Indicates that the power is connected properly. |
| **RECEIVE** | Flashes while scanning for the downstream receive channel. |

| LED | Description |
|---|---|
| | Changes to solid green when single downstream channel is locked.<br>Changes to solid blue when multiple downstream channels are locked. |
| **SEND** | Flashes while scanning for the upstream send channel.<br>Changes to solid green when single upstream channel is locked.<br>Changes to solid blue when multiple upstream channels are locked. |
| **ONLINE** | Flashes during CH6643E registration and configuration.<br>Changes to solid green when the CH6643E is registered successfully and ready for Internet access |

# Wall Mounting the CH6643E

You have the option to wall mount the CH6643E. Do the following before mounting the CH6643E on the wall:

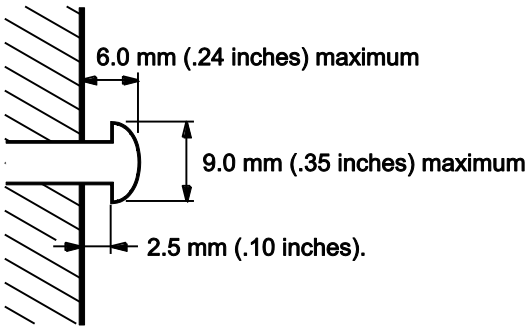
- Locate the unit as specified by the local or national codes governing residential or business cable TV and communications services.
- Follow all local standards for installing a network interface unit/network interface device (NIU/NID).
- Make sure the AC power plug is disconnected from the wall outlet and all cables are removed from the back of the CH6643E before starting the installation.
- Decide if you want to mount the CH6643E horizontally or vertically.

*If possible, mount the unit to concrete, masonry, a wooden stud, or some other very solid wall material. Use anchors if necessary (for example, if you must mount the unit on drywall).*

> ***CAUTION:*** *Before drilling holes, check the structure for potential damage to water, gas, or electrical lines.*

Do the following to mount your CH6643E on the wall:

1. Print a copy of the Wall Mounting Template.
2. Measure the printed template with a ruler to ensure that it is the correct size.
3. Use a center punch to mark the center of the holes.
4. On the wall, locate the marks for the mounting holes.
5. Drill the holes to a depth of at least 1 1/2 inches (3.8 cm). Use M3.5 x 38 mm (#6 x 11/2 inch) screws with a flat underside and maximum screw head diameter of 9.0 mm to mount the CH6643E.
6. Using a screwdriver, turn each screw until part of it protrudes from the wall, as shown in the following wall mounting screw dimensions illustration.




There must be .10 inches (2.5 mm) between the wall and the underside of the screw head.

7. Place the CH6643E so the keyholes on the back of the unit are aligned above the mounting screws.
8. Slide the CH6643E down until it stops against the top of the keyhole opening.
9. After mounting, reconnect the coaxial cable input and Ethernet connection.
10. Plug the power cord into the +12VDC connector on the gateway and the electrical outlet.
11. Route the cables to avoid any safety hazards.

## Wall Mounting Template

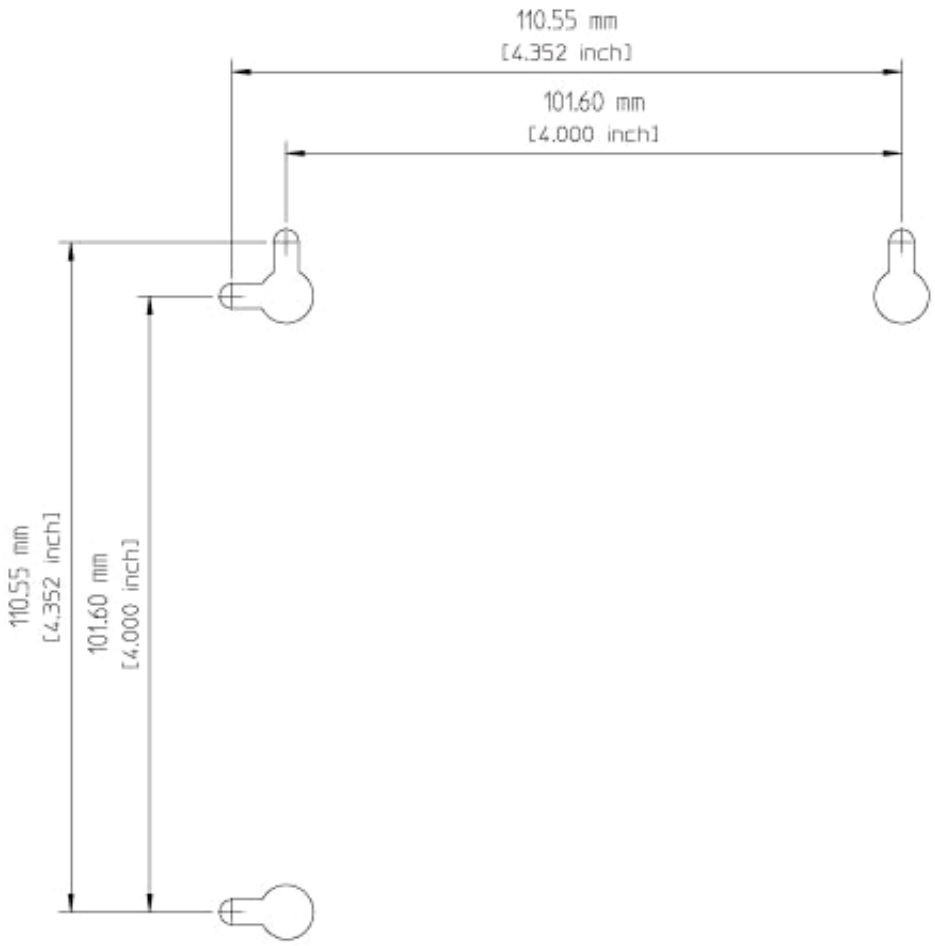



**Figure 1 Wall Mounting Template**

# Setting Up Internet Access

After installing the CH6643E, check that you can connect to the Internet. You can retrieve an IP address for your computer's network interface using one of the following options:

- Retrieve the statically defined IP address and DNS address
- Automatically retrieve the IP address using the Network DHCP server

The CBN CH6643E Wireless Gateway provides a DHCP server on its LAN. It is recommended that you configure your LAN to obtain the IPs for the LAN and DNS server automatically.

Make sure all computers on your LAN are configured for TCP/IP. After configuring TCP/IP on your computer, you should verify the IP address.

> ***Note**: For UNIX or Linux systems, follow the instructions in the applicable user documentation.*

## Configuring TCP/IP in Windows XP

1. Open the **Control Panel**.
2. Double-click **Network Connections** to list the Dial-up and LAN or High-Speed Internet connections.
3. Right-click the network connection for your network interface.
4. Select **Properties** from the drop-down menu to display the Local Area Connection Properties window. Be sure Internet Protocol (TCP/IP) is checked.
5. Select **Internet Protocol (TCP/IP)** and click **Properties** to display the Internet Protocol (TCP/IP) Properties window.
6. Select **Obtain an IP address automatically** and **Obtain DNS server address automatically**.
7. Click **OK** to save the TCP/IP settings and exit the TCP/IP Properties window.
8. Close the Local Area Connection Properties window and then exit the Control Panel.
9. When you complete the TCP/IP configuration, continue with Verifying the IP Address in Windows XP.

## Configuring TCP/IP in Windows Vista

1. Open the **Control Panel**.
2. Click **Network and Internet** to display the Network and Internet window.
3. Click **Network and Sharing Center** to display the Network and Sharing Center window.
4. Click **Manage network connections** to display the LAN or High-Speed Internet connections window.
5. Right-click the network connection for the network interface you want to change.
6. Click **Properties** to display the Local Area Connection Properties window.

   Vista may prompt you for an administrator password or confirmation. Type the password or confirmation, then click **Continue**.
7. Click **Networking** tab, then select **Internet Protocol Version 4 (IPv4)**.
8. Click **Properties** to display the Internet Protocol Version 4 (TCP/IPv4) Properties window.
9. Select **Obtain an IP address automatically** and **Obtain DNS server address automatically**.
10. Click **OK** to save the TCP/IP settings and close the Internet Protocol Version 4 (TCP/IPv4) Properties window.
11. Click **OK** to close the Local Area Connection Properties window.
12. Close the remaining windows and exit the Control Panel.
13. When you complete the TCP/IP configuration, continue with Verifying the IP Address in Windows Vista.

## Verifying the IP Address in Windows XP

To check the IP address:

1. On the Windows Desktop, click **Start**.
2. Select **Run**. The Run window is displayed.
3. Type **cmd** and click **OK**.
4. Type **ipconfig** and press **ENTER** to display your IP configuration.

If an Auto-configuration IP Address displays, this indicates possible cable network problems or an improper connection between your computer and the CH6643E.

Check the following:

- Your cable connections
- Whether you can see cable-TV channels on your television

After successfully verifying your cable connections and proper cable-TV operation, you can renew your IP address.

## Verifying the IP Address in Windows Vista

Do the following to verify the IP address:

1. On the Windows Desktop, click **Start**.
2. Click **All Programs**.
3. Click **Accessories**.
4. Click **Command Prompt** to open a command prompt window.
5. Type **ipconfig** and press **Enter** to display the IP address.

If an Auto-configuration IP Address displays, this indicates an improper connection between your computer and the CH6643E, or there are possible cable network problems.

## Renewing Your IP Address

To renew your IP address in Windows XP or Windows Vista:

1. Open a command prompt window.
2. At the command prompt, type **ipconfig /renew** and press **ENTER** to obtain a new IP address.
3. Type **exit** and press **ENTER** to close the command prompt window.

If after performing this procedure your computer still cannot access the Internet, call your cable service provider for assistance.

# Setting Up a Wi-Fi Network

Do the following to set up a Wi-Fi network using the WPS button on the CH6643E:

1. Power on the CH6643E.
2. Power on the WPS-enabled devices you want to have access to the network, such as a PC, router, or telephone.

   The Wi-Fi network will automatically detect the WPS devices.
3. Press **WPS** button on the CH6643E.
4. If applicable, press **WPS** button on the other WPS devices.

# 3 Basic Configuration

For normal operation, you do not need to change most default settings. Carefully consider the following caution statements:

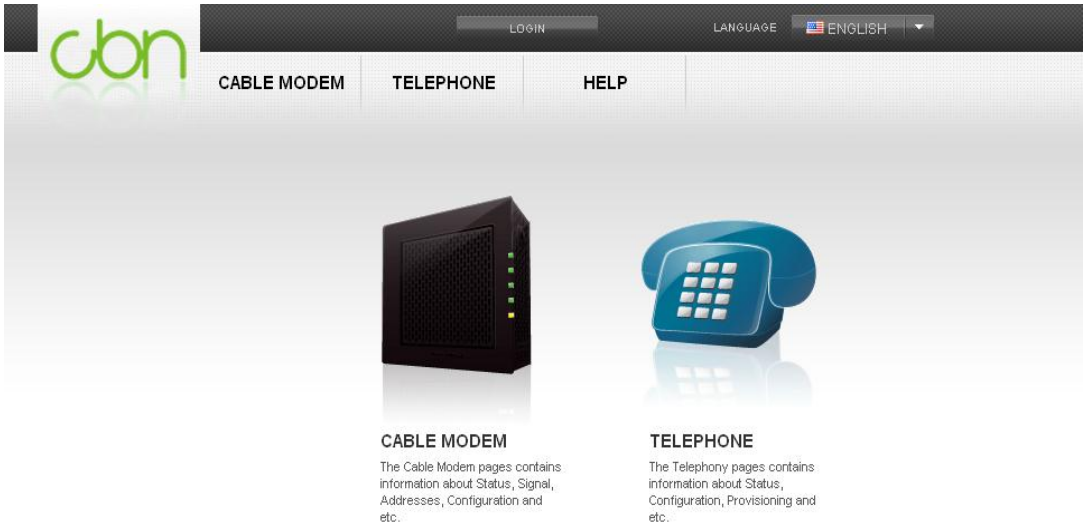
## Starting the CH6643E Configuration Manager (CMGR)

The CH6643E Configuration Manager (CMGR) allows you to change and view the settings on your CH6643E.

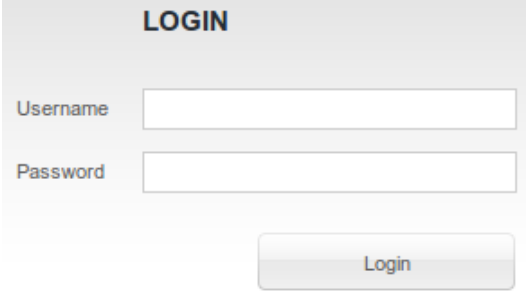
1. Open the web browser on a computer connected to the CH6643E over an Ethernet connection.

> ***Note:*** *Do not attempt to configure the CH6643E over a wireless connection.*

2. In the Address or Location field of your browser, type **http://192.168.0.1** and press **`ENTER`**, and then you will get into homepage.




CMGR provide more information and gateway functions for experienced users in privileged mode, you can login by click the “LOGIN” button on the top of window then input Username and Password.




There are two default privileged account in CH6643E:

| Username | Password | Privilege |
|---|---|---|
| **admin** | **admin** | Allow access gateway pages |
| **root** | **compalbn** | Operator mode. Allow access gateway, provisioning pages and provide more configuration information. |

# CH6643E Menu Options Bar

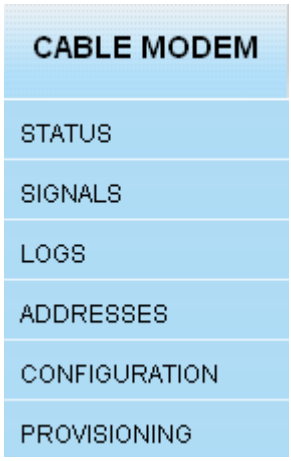
The CH6643E Menu Options bar is displayed at the top of the CH6643E Configuration Manager window.

**Configuration Manager Menu Options Bar**

| Menu Option Pages | Function |
|---|---|
| **CABLE MODEM** | The Cable Modem pages contain information about Status, Signal, Addresses, Configuration, and etc. |
| **GATEWAY** | The Gateway pages contain information about LAN, Firewall, Wireless configuration, and etc. |
| **TELEPHONE** | The Telephony pages contain information about Status, Configuration, Provisioning, and etc. |
| **HELP** | This page provides an overview of the Modem Configuration Manager, and brief troubleshooting information. |

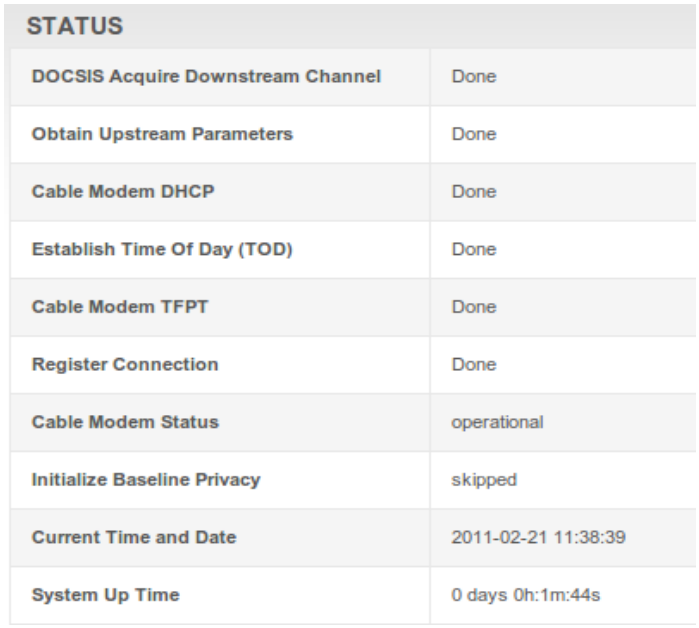
# 4 CABLE MODEM Pages

The CABLE MODEM pages provide the information of cable connection status, channel signals, network IP address, and system logs during the establishment of cable connection to cable service provider's CMTS.




## CABLE MODEM Status Page

This page provides information about the startup process of the Cable Modem.



# CABLE MODEM Signals Page

This page provides information about the connection between the Cable Modem and the CMTS of cable service provider.

**SIGNALS**

| Downstream | Heading Channel Value |
|---|---|
| Channel ID | 124 |
| Frequency | 410000000 |
| Signal to Noise Ratio (SNR) | 35 |
| QAM - Downstream Modulation | 256qam |
| Power Level (dBmV) | 18 |

| Upstream | Heading Channel Value |
|---|---|
| Channel ID | 1 |
| Frequency | 35000000 |
| Ranging Service ID | 112 |
| Symbol Rate | 1.280 |
| Power Level (dBmV) | 35 |
| Ranging Status | success |
| Upstream Modulation | [3] qpsk<br>[3] 64qam |

| Signal Stats | Heading Channel Value |
|---|---|
| Channel ID | 124 |
| Total Unerrored Codewords | 65199242 |
| Total Correctable Codewords | 45132022 |
| Total Uncorrectable Codewords | 1257 |

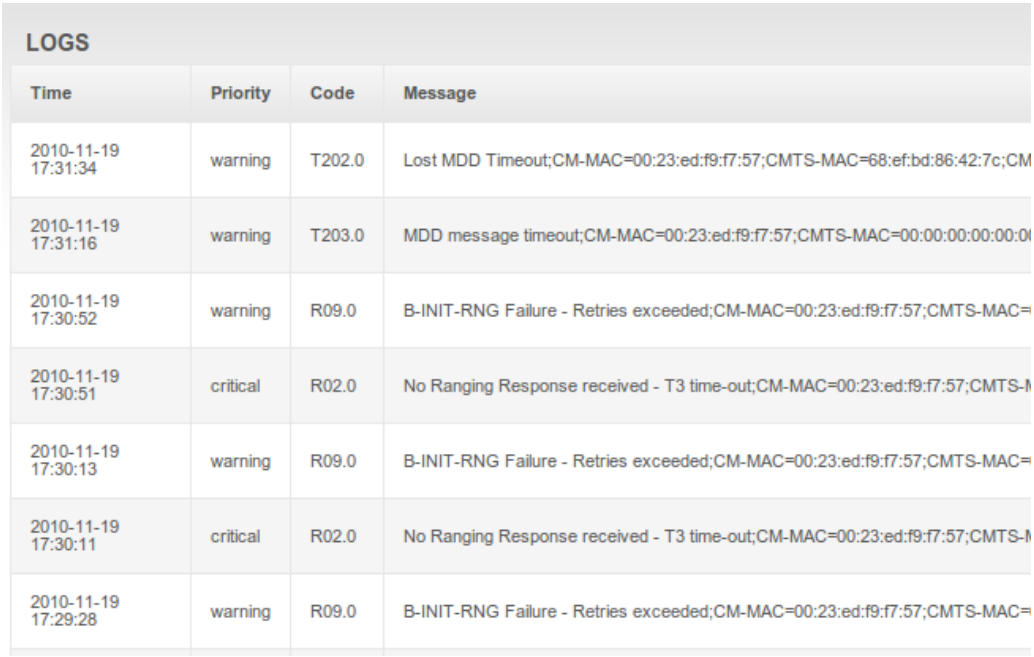
### Field Descriptions for the Status Connection Page

| Field | Description |
|---|---|
| **Downstream** | Status information about the RF downstream channels, including downstream channel frequency and downstream signal power and modulation. |

| Field | Description |
|---|---|
| **Upstream** | Status information about the RF upstream channels, including upstream channel ID and upstream signal power and modulation. |

# CABLE MODEM Logs Page

This page lists the critical system events in chronological order. a sample event log is shown below:



LOGS

| Time | Priority | Code | Message |
|---|---|---|---|
| 2010-11-19 17:31:34 | warning | T202.0 | Lost MDD Timeout;CM-MAC=00:23:ed:f9:f7:57;CMTS-MAC=68:ef:bd:86:42:7c;CM |
| 2010-11-19 17:31:16 | warning | T203.0 | MDD message timeout;CM-MAC=00:23:ed:f9:f7:57;CMTS-MAC=00:00:00:00:00:0 |
| 2010-11-19 17:30:52 | warning | R09.0 | B-INIT-RNG Failure - Retries exceeded;CM-MAC=00:23:ed:f9:f7:57;CMTS-MAC= |
| 2010-11-19 17:30:51 | critical | R02.0 | No Ranging Response received - T3 time-out;CM-MAC=00:23:ed:f9:f7:57;CMTS-M |
| 2010-11-19 17:30:13 | warning | R09.0 | B-INIT-RNG Failure - Retries exceeded;CM-MAC=00:23:ed:f9:f7:57;CMTS-MAC= |
| 2010-11-19 17:30:11 | critical | R02.0 | No Ranging Response received - T3 time-out;CM-MAC=00:23:ed:f9:f7:57;CMTS-M |
| 2010-11-19 17:29:28 | warning | R09.0 | B-INIT-RNG Failure - Retries exceeded;CM-MAC=00:23:ed:f9:f7:57;CMTS-MAC= |

**Field Descriptions for the Status Event Log Page**

| Field | Description |
|---|---|
| **Time** | Indicates the date and time the error occurred |
| **Priority** | Indicates the level of importance of the error |
| **Message** | A brief definition of the error |

# CABLE MODEM Addresses Page

This page provides the HFC and IP network connectivity status of the CH6643E.

**ADDRESSES**

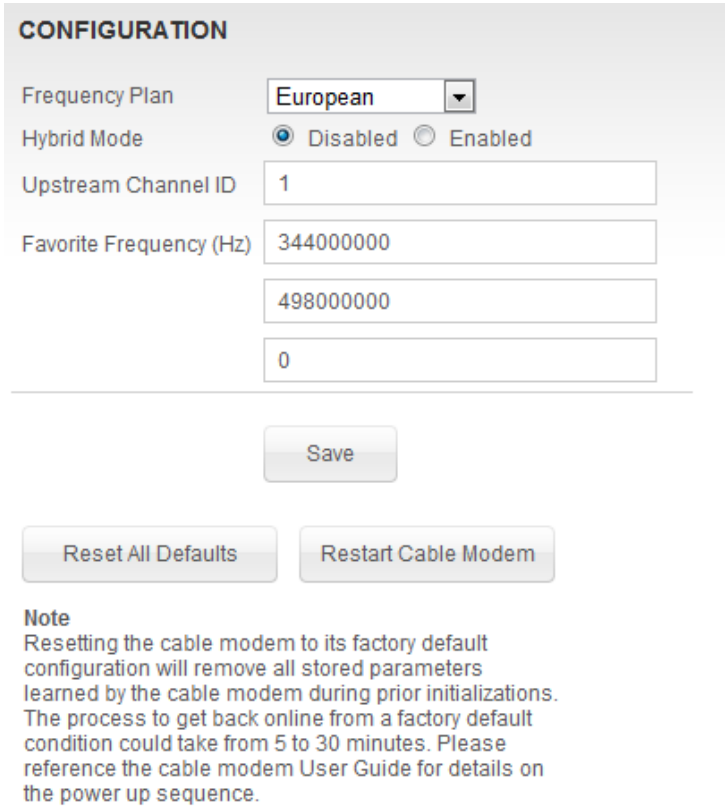
| Item | Value |
|---|---|
| HFC IP Address | 172.16.180.35 |
| HFC MAC Address | 00-23-ED-F9-F7-57 |
| Ethernet IP Address | 192.168.100.1 |
| Ethernet MAC Address | 3C-75-4A-F0-D6-A2 |

| Known CPE MAC Address ( Max 16 ) | Status |
|---|---|
| 00:23:ED:F9:F7:59 | static |
| 3C:75:4A:F0:30:D6 | learned |

# CABLE MODEM Configuration Page

This page is able to configure upstream channel ID and 3 Favorite Frequencies then save it. Cable modem will scan the frequency you specify first.

Reset All Defaults button will reset all configurations of the cable modem to factory defaults.

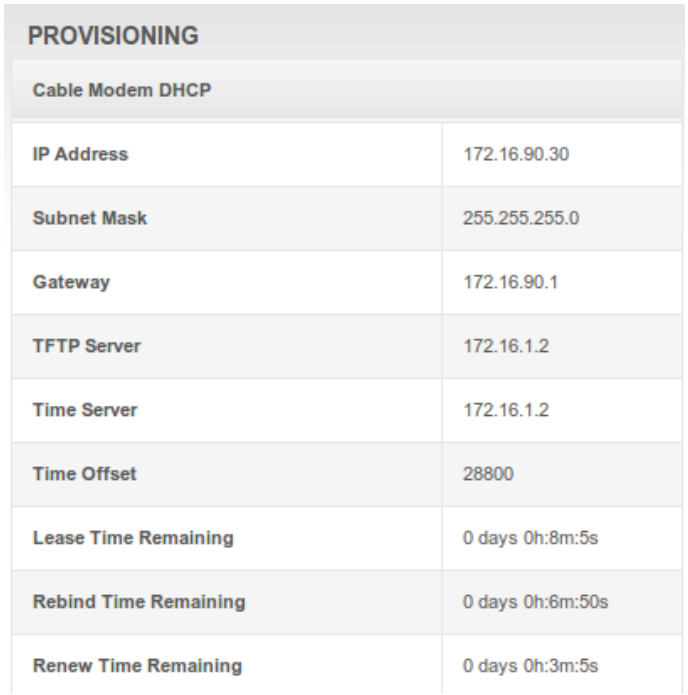

CONFIGURATION
Frequency Plan
European
Hybrid Mode
Disabled
Enabled
Upstream Channel ID
1
Favorite Frequency (Hz)
344000000
498000000
0
Save
Reset All Defaults
Restart Cable Modem
Note
Resetting the cable modem to its factory default configuration will remove all stored parameters learned by the cable modem during prior initializations. The process to get back online from a factory default condition could take from 5 to 30 minutes. Please reference the cable modem User Guide for details on the power up sequence.

**Field Descriptions for the CABLE MODEM Configuration Page**

| Field | Description |
|---|---|
| **Frequency Plan** | European and North American<br>Specify frequency plan type. |
| **Hybrid Mode** | Cable modem based on European model has the ability to scan both European and North American frequency plans. If hybrid mode is set, cable modem will try to acquire a Euro-DOCSIS (8 Mhz channel width) and DOCSIS (6 Mhz channel width) signal on the each scanned frequency. |
| **Upstream Channel ID** | Specify upstream channel ID |
| **Favorite Frequency (Hz)** | Set 3 favorite frequencies in Hz which cable modem will prior to try to lock. |

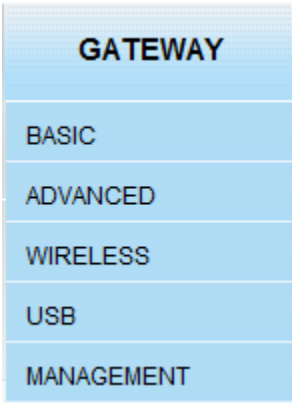
# CABLE MODEM Provisioning Page

This page shows IP provisioning status from DHCP, this item only appears in operator mode.



# 5 GATEWAY Basic Pages

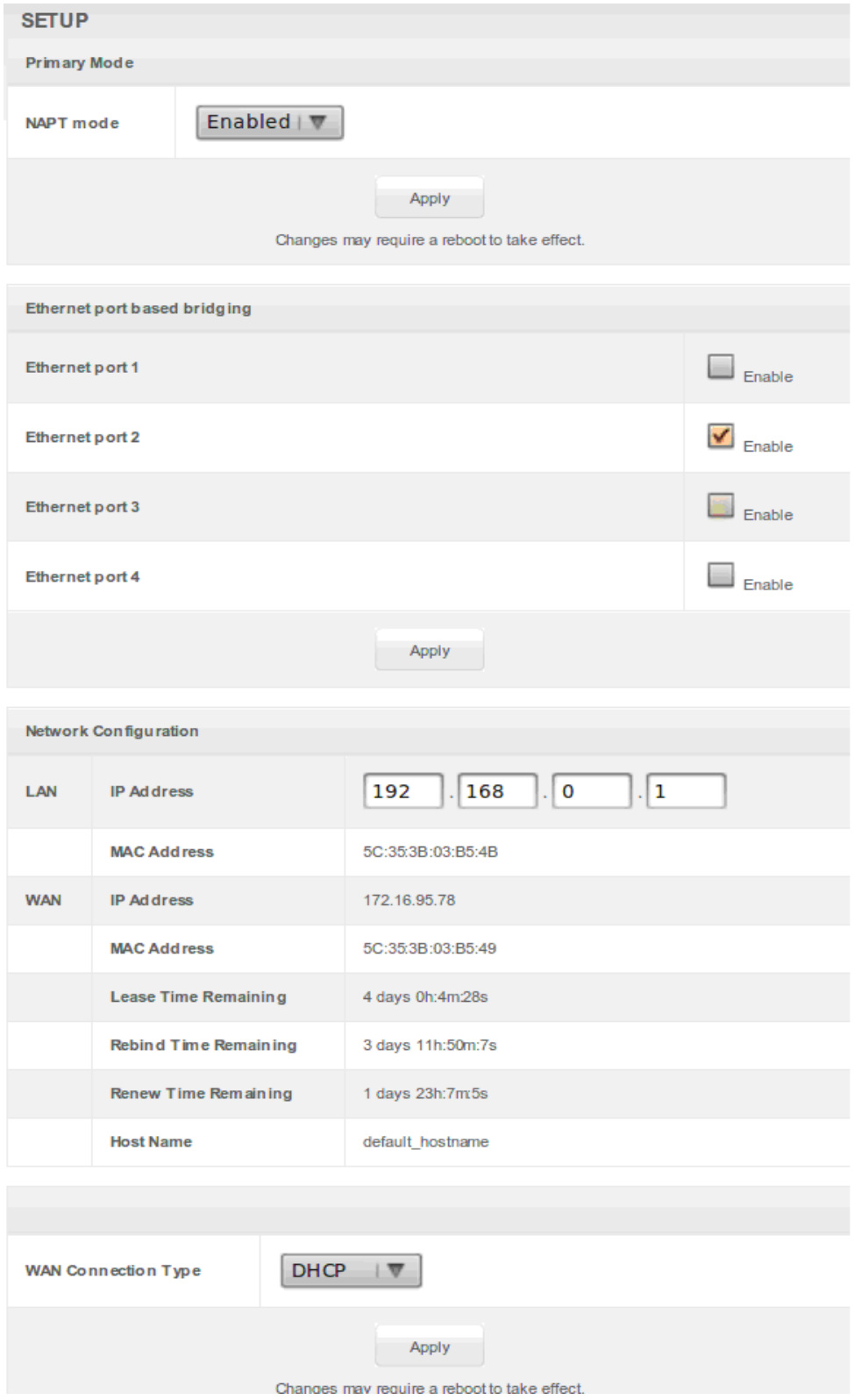
CH6643E GATEWAY pages provide five major items including BASIC, ADVANCED, WIRELESS, USB and MANAGEMENT to control all gateway functions, describing respectively as below.




## Basic Setup Page

The CH6643E Basic Pages allow you to view and configure CH6643E IP-related configuration data, including Network Configuration, WAN Connection Type and DHCP. You can click any Basic submenu option to view or change the configuration information for that option.

This page allows you to configure the basic features of your CH6643E gateway related to your ISP connection.


SETUP
Primary Mode
NAPT mode
Enabled
Apply
Changes may require a reboot to take effect.
Ethernet port based bridging
Ethernet port 1
Enable
Ethernet port 2
Enable
Ethernet port 3
Enable
Ethernet port 4
Enable
Apply
Network Configuration
LAN
IP Address
192 . 168 . 0 . 1
MAC Address
5C:35:3B:03:B5:4B
WAN
IP Address
172.16.95.78
MAC Address
5C:35:3B:03:B5:49
Lease Time Remaining
4 days 0h:4m:28s
Rebind Time Remaining
3 days 11h:50m:7s
Renew Time Remaining
1 days 23h:7m:5s
Host Name
default_hostname
WAN Connection Type
DHCP
Apply
Changes may require a reboot to take effect.

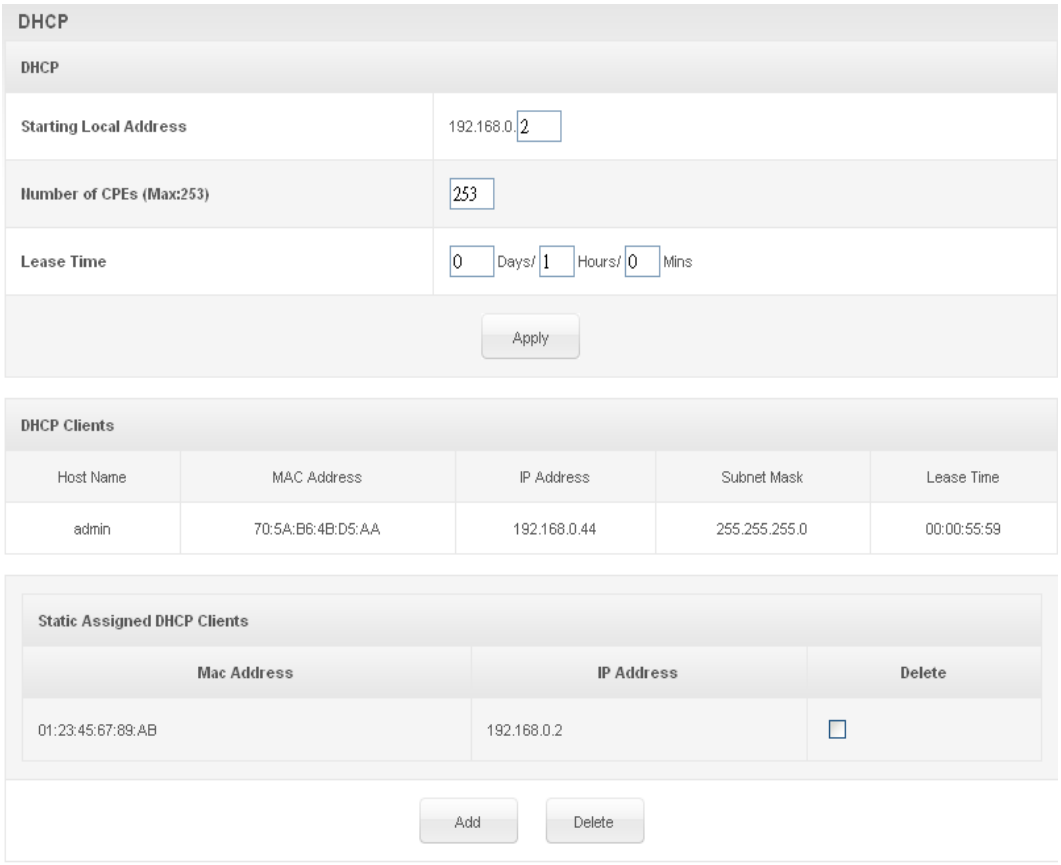
**Field Descriptions for the Basic Setup Page**

| Field | Description |
|---|---|
| **NAPT mode** | NAPT is a special case of NAT, where many IP numbers are hidden behind a number of addresses. In contrast to the original NAT, however, this does not mean there can be only that number of connections at a time.<br>In NAPT mode, an almost arbitrary number of connections are multiplexed using TCP port information. The number of simultaneous connections is limited by the number of addresses multiplied by the number of available TCP ports. |
| **Ethernet port based bridging** | In NAPT mode, When the check box set, indicates network traffic from which particular Ethernet port will be bridged to HFC interface. When the checkbox cleared, indicates network traffic from which particular Ethernet port will be handled by Gateway routing features. |
| **LAN** | |
| **IP Address** | Enter the IP address of the CH6643E on your private LAN. |
| **MAC Address** | Media Access Control address — a set of 12 hexadecimal digits assigned during manufacturing that uniquely identifies the hardware address of the CH6643E Access Point. |
| **WAN** | |
| **IP Address** | The public WAN IP address of your CH6643E device, which is either dynamically or statically assigned by your ISP. |
| **MAC Address** | Media Access Control address — a set of 12 hexadecimal digits assigned during manufacturing that uniquely identifies the hardware address of the CH6643E Access Point. |
| **Rebind Time Remaining** | Describes how long before your DHCP server binding expires. The WAN lease will automatically rebind itself when it expires. |
| **Renew Time Remaining** | Describes how long before your Internet connection expires. The WAN lease will automatically renew itself when it expires. |
| **WAN Connection Type** | DHCP or Static IP.<br>If your ISP uses static IP addressing, select **Static IP** and enter the information provided by your ISP for Static IP Address, Static IP Mask, Default Gateway, Primary DNS, and Secondary DNS. |

When done, click **Apply** to save your changes.

# Basic DHCP Page

This page allows you to configure and view the status of the optional internal CH6643E DHCP (Dynamic Host Configuration Protocol) server for the LAN.




> ***CAUTION:*** *Do not modify these settings unless you are an experienced network administrator with strong knowledge of IP addressing, subnetting, and DHCP.*

### Field Descriptions for the Basic DHCP Page

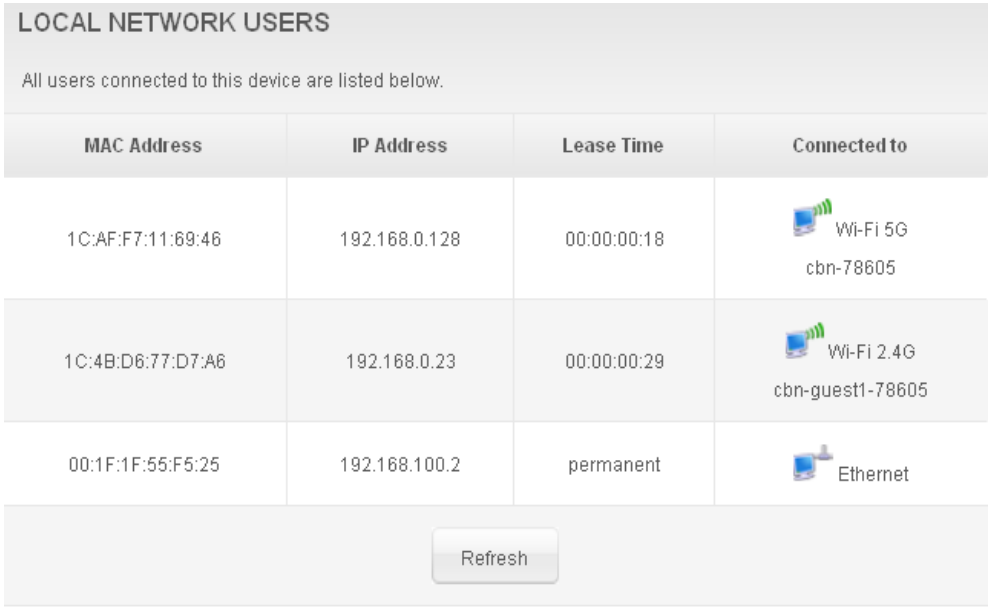
| Field | Description |
|---|---|
| **Starting Local Address** | Enter the starting IP address to be assigned by the CH6643E DHCP server to clients in dotted-decimal format. The default is 192.168.0.2. |
| **Number of CPEs** | Sets the number of clients for the CH6643E DHCP server to assign a private IP address. There are 253 possible client addresses. |
| **Lease Time** | Sets the time in seconds that the CH6643E DHCP server leases an IP address to a client. The default is 3600 seconds (60 minutes). |

| Field | Description |
|---|---|
| **DHCP Clients** | Lists DHCP client device information. |
| **Static Assigned DHCP clients** | Reserve IP addresses assigned by the CH6643E DHCP server for specific LAN clients |

When done, click **Apply** to save your changes.

# Basic LAN Users Page

This page contains a list of LAN users which associated to this device.



# 6 GATEWAY Advanced Pages

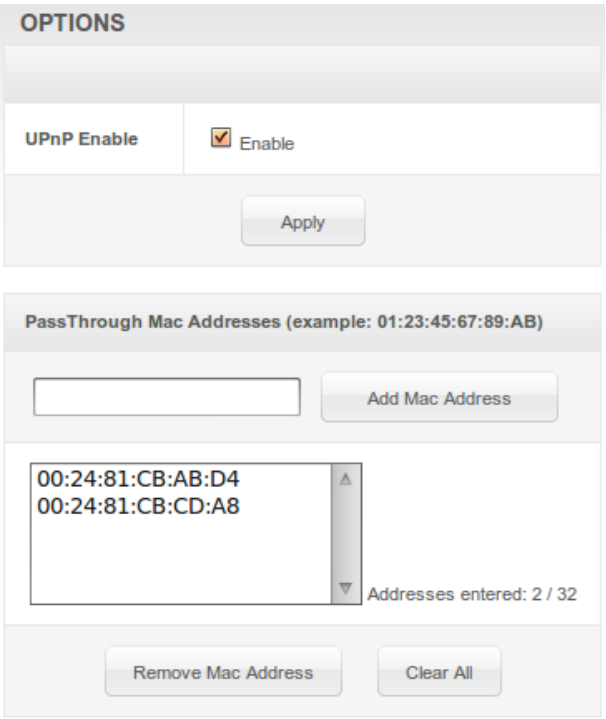
The CH6643E Advanced Pages allow you to configure the advanced features of the CH6643E:

| |
|---|
| OPTIONS |
| IP FILTERING |
| MAC FILTERING |
| PORT FILTERING |
| FORWORDING |
| PORT TRIGGERS |
| DMZ HOST |
| DYNAMIC DNS |
| IDS |

You can click any Advanced submenu option to view or change the advanced configuration information for that option.

## Advanced Options Page

This page allows you to set the operating modes for adjusting how the CH6643E device routes IP traffic.




**Field Descriptions for the Advanced Options Page**

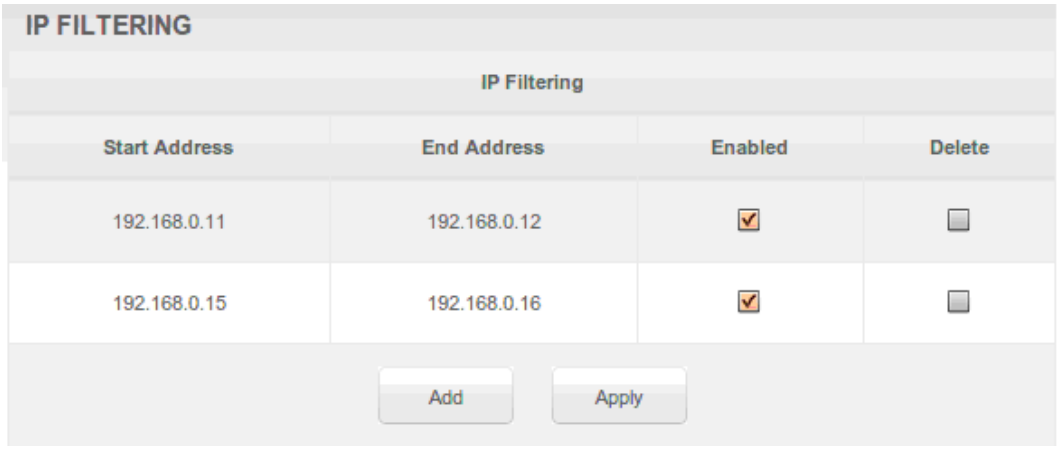
| Field | Description |
|---|---|
| **UPnP Enable** | Turns on the Universal Plug and Play protocol (UPnP) agent in the configuration manager. If you are running a CPE (client) application that requires UPnP, select this box.<br>Checkmark **Enable** to turn on this option. |
| **PassThrough Mac Addresses** | Specifies up to 32 computers as pass-through clients not subject to NAT, using their MAC addresses.<br>To enable this feature, your cable operator may need to provide additional public IP addresses. |

When done, click **Apply** to save your changes.

# Advanced IP Filtering Page

This page allows you to define which local PCs will be denied access to the CH6643E WAN. You can configure IP address filters to block Internet traffic to specific network devices on the LAN by entering start and end IP address ranges. Note that you only need to enter the LSB (Least-significant byte) of the IP address; the upper bytes of the IP address are set automatically from the CH6643E Configuration Manager's IP address.

The Enabled option allows you to store filter settings commonly used but not have them active.



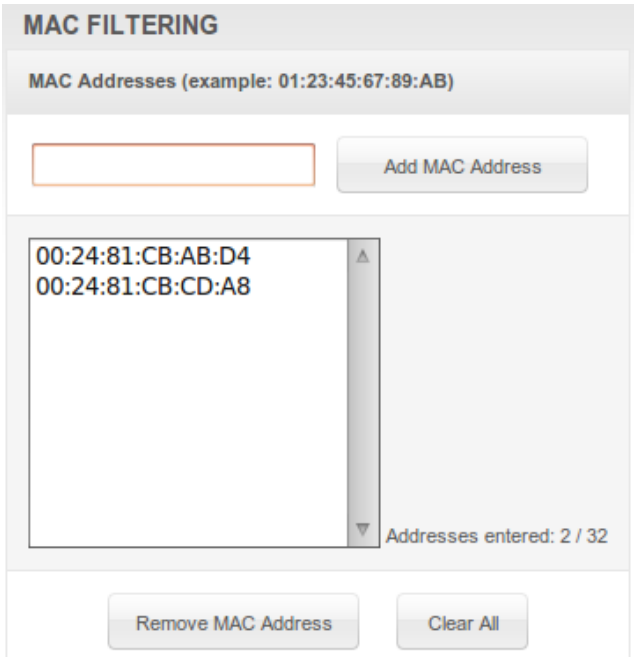

**Field Descriptions for the Advanced IP Filtering Page**

| Field | Description |
|---|---|
| **Start Address** | Enter the start IP address range of the computers for which you want to deny access to the CH6643E WAN. |
| **End Address** | Enter the end IP address range of the computers you want to deny access to the CH6643E WAN. |
| **Enabled** | Activates the IP address filter, when selected.<br>Checkmark **Enabled** for each range of IP addresses you want to deny access to the CH6643E WAN. |
| **Delete** | Remove the IP address filter, when selected.<br>Checkmark **Delete** for each range of IP filter you want to remove. |

When done, click **Apply** to activate and save your settings.

# Advanced MAC Filtering Page

This page allows you to define up to twenty Media Access Control (MAC) address filters to prevent PCs from sending outgoing TCP/UDP traffic to the WAN via their MAC addresses. This is useful because the MAC address of a specific NIC card never changes, unlike its IP address, which can be assigned via the DHCP server or hard-coded to various addresses over time.




**Field Descriptions for the Advanced MAC Filtering Page**

| Field | Description |
|---|---|
| **MAC Addresses** | Media Access Control address — a unique set of 12 hexadecimal digits assigned to a PC during manufacturing. |

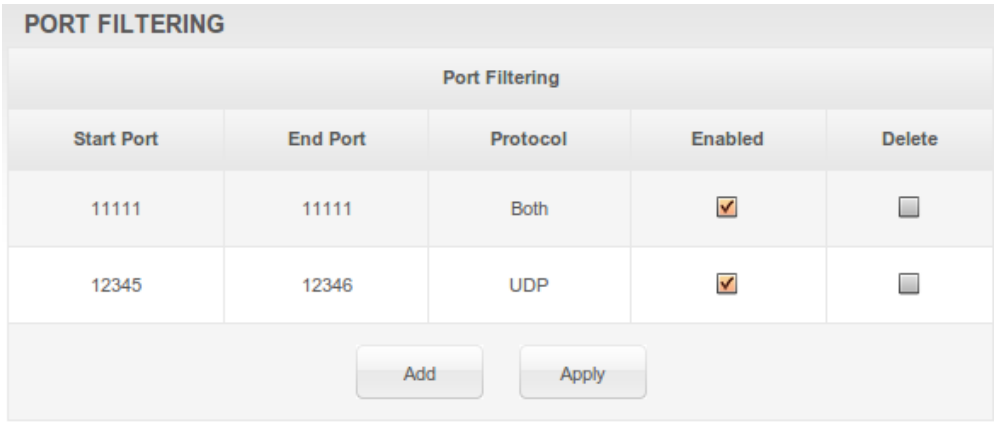
## Setting a MAC Address Filter

1. Enter the MAC address in the MAC Addresses field for the PC you want to block.
2. Click **Add MAC Address**.
3. Repeat above steps for up to twenty MAC addresses.

# Advanced Port Filtering Page

This page allows you to define port filters to prevent all devices from sending outgoing TCP/UDP traffic to the WAN on specific IP port numbers. By specifying a starting and ending port range, you can determine what TCP/UDP traffic is allowed out to the WAN on a per-port basis.

> ***Note:*** *The specified port ranges are blocked for ALL PCs, and this setting is not IP address or MAC address specific. For example, if you wanted to block all PCs on the private LAN from accessing HTTP sites (or "web surfing"), you would set the "Start Port" to 80, "End Port" to 80, "Protocol" to TCP, checkmark Enabled, and then click* ***Apply.***

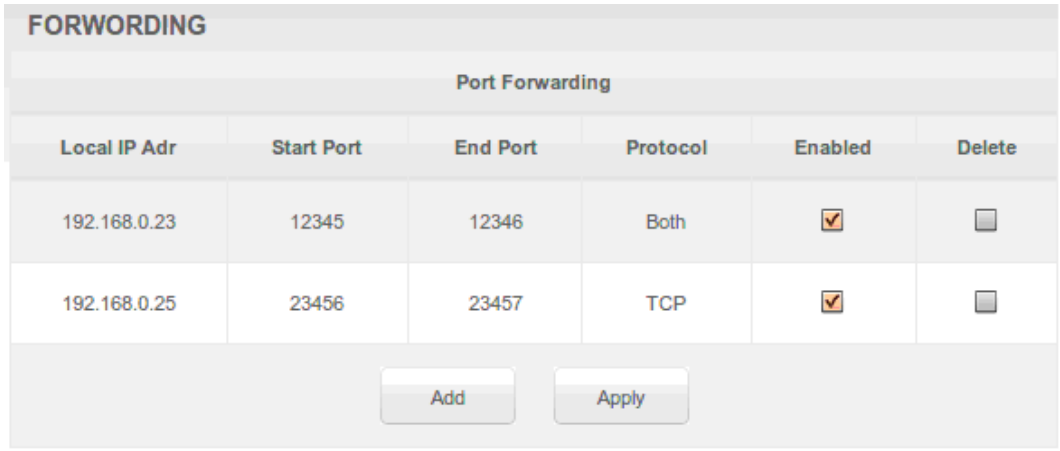



**Field Descriptions for the Advanced Port Filtering Page**

| Field | Description |
|---|---|
| **Start Port** | Start port number. |
| **End Port** | End port number. |
| **Protocol** | **TCP**, **UDP**, or **Both** . |
| **Enabled** | Checkmark for each port that you want to activate the IP port filters. |
| **Delete** | Checkmark for each port that you want to remove the IP port filters. |

# Advanced Port Forwarding Page

This page allows you to run a publicly accessible server on the LAN by specifying the mapping of TCP/UDP ports to a local PC. This enables incoming requests on specific port numbers to reach web servers, FTP servers, mail servers, etc. so that they can be accessible from the public Internet.




The ports used by some common applications are:

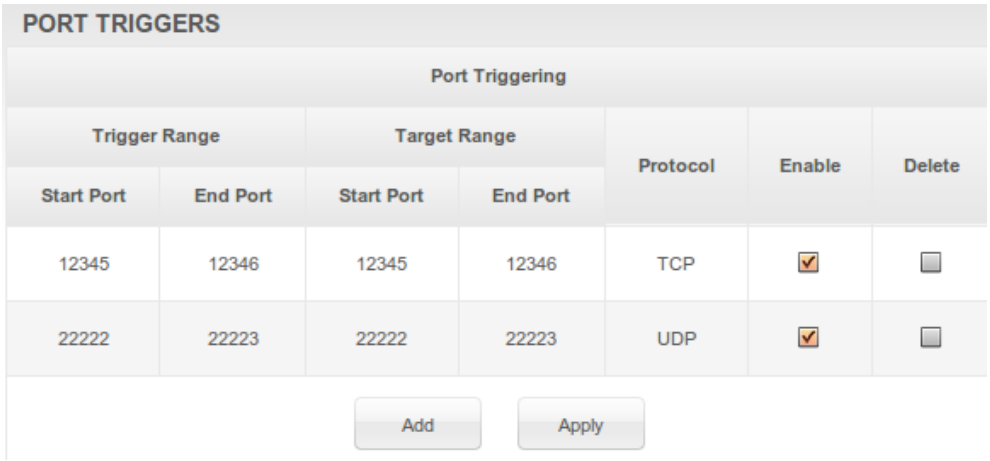
- HTTP: 80
- FTP: 20, 21
- Secure Shell: 22
- Telnet: 23
- SMTP e-mail: 25
- SNMP: 161

To map a port, you must enter the range of port numbers that should be forwarded locally and the IP address to which traffic to those ports should be sent. If only a single port specification is desired, enter the same port number in the “start” and “end” locations for that IP address.

# Advanced Port Triggers Page

This page allows you to configure dynamic triggers to specific devices on the LAN. This allows for special applications that require specific port numbers with bi-directional traffic to function properly. Applications such as video conferencing, voice, gaming, and some messaging program features may require these special settings.

The Advanced Port Triggers are similar to Advanced Port Forwarding except that they are not static ports held open all the time. When the Configuration Manager detects outgoing data on a specific IP port number set in the “Trigger Range,” the resulting ports set in the “Target Range” are opened for incoming (sometimes referred to as bi-directional ports) data. If no outgoing traffic is detected on the “Trigger Range” ports for 10 minutes, the “Target Range” ports will close. This is a safer method for opening specific ports for special applications (e.g. video conferencing programs, interactive gaming, file transfer in chat programs, etc.) because they are dynamically triggered and not held open constantly or erroneously left open via the router administrator and exposed for potential hackers to discover.




**Field Descriptions for the Advanced Port Triggers Page**

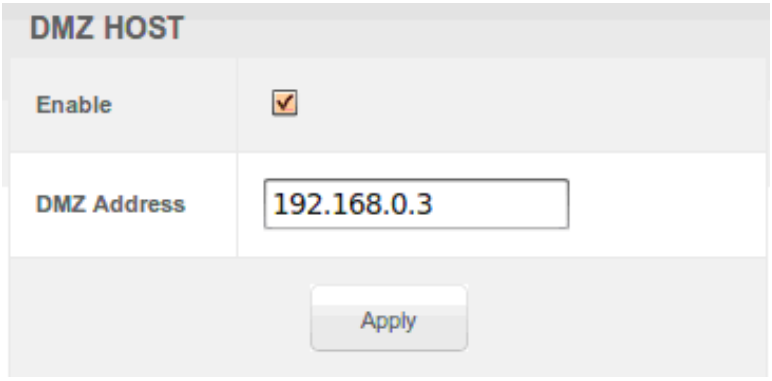
| Field | Description |
|---|---|
| **Trigger Range** | |
| **Start Port** | The start port number of the Port Trigger range. |
| **End Port** | The end port number of the Port Trigger range. |
| **Target Range** | |
| **Start Port** | The start port number of the Port Trigger range. |
| **End Port** | The end port number of the Port Trigger range. |
| **Protocol** | **TCP**, **UDP**, or **Both**. |
| **Enable** | Select checkbox to activate the IP port triggers. |
| **Delete** | Select checkbox to remove the IP port triggers. |

# Advanced DMZ Host Page

This page allows you to specify the default recipient of WAN traffic that NAT is unable to translate to a known local PC. The DMZ (De-militarized Zone) hosting (also commonly referred to as “Exposed Host”) can also be described as a computer or small sub-network that is located outside the firewall between the trusted internal private LAN and the un-trusted public Internet. It prevents direct access by outside users to private data.

For example, you can set up a web server on a DMZ computer to enable outside users to access your website without exposing confidential data on your network.

A DMZ can also be useful to play interactive games that may have a problem running through a firewall. You can leave a computer used for gaming only exposed to the Internet while protecting the rest of your network.



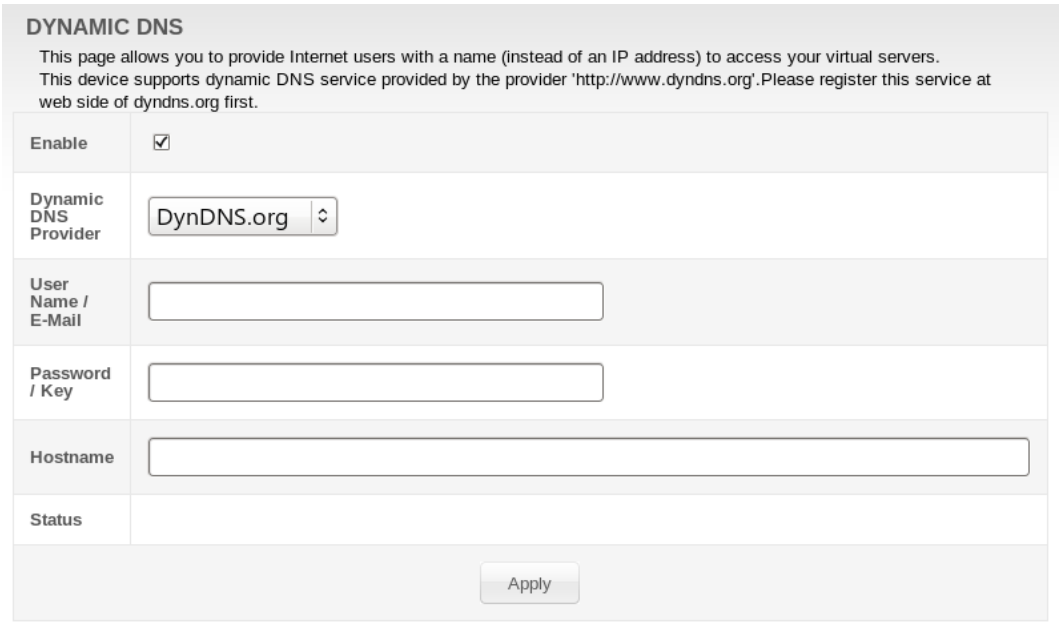

You may configure one PC to be the DMZ host. This setting is generally used for PCs using problem applications that use random port numbers and do not function correctly with specific port triggers or the port forwarding setups mentioned earlier. If a specific PC is set as a DMZ Host, remember to set this back to zero when you are finished with the needed application, since this PC will be effectively exposed to the public Internet, though still protected from Denial of Service (DoS) attacks via the Firewall.

## Setting Up the DMZ Host

1. Enter the computer’s IP address and select **Enable** checkbox.
2. Click **Apply** to activate the selected computer as the DMZ host.

# Dynamic DNS

This page allows you to provide Internet users with a name (instead of an IP address) to access your virtual servers. CH6643E supports dynamic DNS service provided by DynDNS.org, ChangeIP.com, No-IP.com and TZO.com. Please register this service at web site of them first.


DYNAMIC DNS
This page allows you to provide Internet users with a name (instead of an IP address) to access your virtual servers.
This device supports dynamic DNS service provided by the provider 'http://www.dyndns.org'.Please register this service at web side of dyndns.org first.
Enable
Dynamic DNS Provider
DynDNS.org
User Name / E-Mail
Password / Key
Hostname
Status
Apply

**Field Descriptions for the Dynamic DNS Page**

| Field | Description |
|---|---|
| **Enable** | Check the box to enable Dynamic DNS. |
| **Dynamic DNS Provider** | Choose your Dynamic DNS provider from the drop down menu. |
| **User Name** | Enter the user name for your Dynamic DNS account. |
| **Password** | Enter the password for your Dynamic DNS account. |
| **Hostname** | Enter the host name that you registered with your Dynamic DNS provider. |
| **Status** | Indicate the status of DDNS service. |

# Advanced IDS Page

The CH6643E IDS Pages allow you to configure the CH6643E firewall filters and firewall alert notifications. The CH6643E firewall protects the CH6643E LAN from undesired attacks and other intrusions from the Internet. It provides an advanced, integrated stateful-inspection firewall supporting intrusion detection, session tracking, and denial-of-service attack prevention. The firewall:

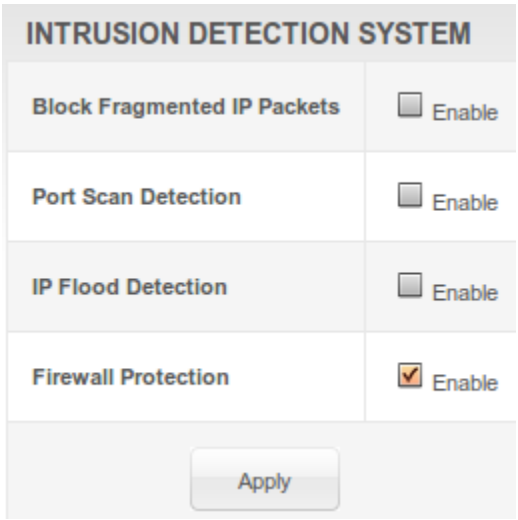
- Maintains state data for every TCP/IP session on the OSI network and transport layers.
- Monitors all incoming and outgoing packets, applies the firewall policy to each one, and screens for improper packets and intrusion attempts.
- Provides comprehensive logging for all:

- User authentications
- Rejected internal and external connection requests
- Session creation and termination
- Outside attacks (intrusion detection)

The predefined policies provide outbound Internet access for computers on the CH6643E LAN. The CH6643E firewall uses stateful-inspection to allow inbound responses when there already is an outbound session running that corresponds to the data flow. For example, if you use a web browser, outbound HTTP connections are permitted on port 80. Inbound responses from the Internet are allowed because an outbound session is established.

When required, you can configure the CH6643E firewall to allow inbound packets without first establishing an outbound session. You also need to configure a port forwarding entry on the Advanced Port Forwarding Page or a DMZ client on the Advanced DMZ Host Page.

This page allows you to configure the firewall by enabling or disabling various protection features. Block Fragmented IP packets prevent all fragmented IP packets from passing through the firewall. Port Scan Detection detects and blocks port scan activity originating on both the LAN and WAN. IP Flood Detection detects and blocks packet floods originating on both the LAN and WAN.

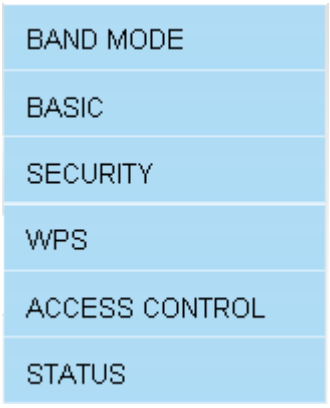



Checkmark **Enable** for each Web filter you want to set for the firewall, and then click **Apply**. The Web filters will activate without having to reboot the CH6643E Configuration Manager.

# 7 GATEWAY Wireless Pages

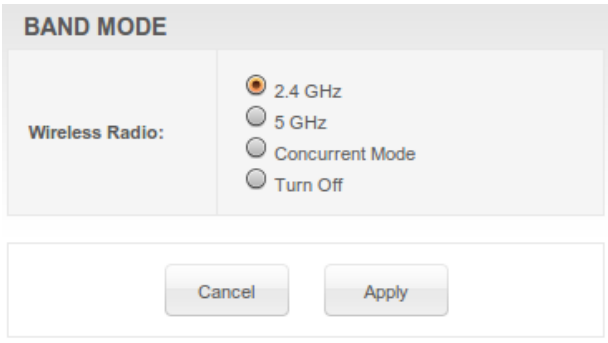
The CH6643E Wireless Pages allow you to configure your wireless LAN (WLAN).

You can click any Wireless submenu option to view or change the configuration information for that option. WPA or WPA2 encryption provides higher security than WEP encryption, but older wireless client cards may not support the newer WPA or WPA2 encryption methods.



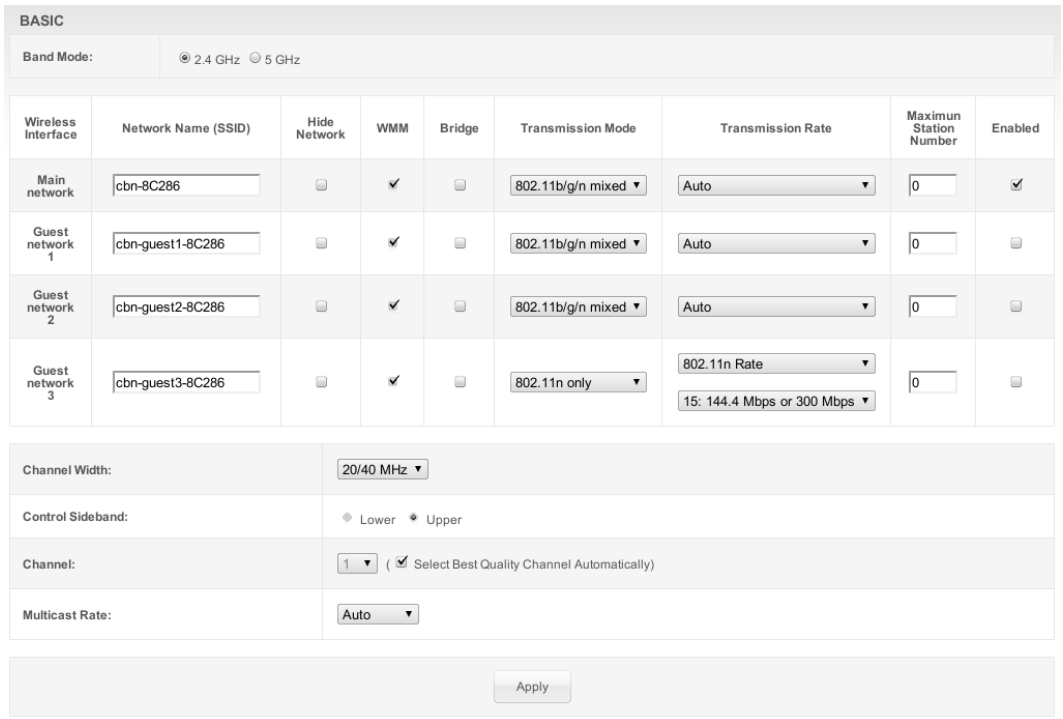

## Wireless Band Mode Page

CH6643E is a dual band concurrent product, therefore two wireless radio configurations are provided. This page allows you to configure the Wireless band mode, Select 2.4GHz if you want to use the 2.4GHz band only or 5GHz band if you want to use the 5GHz band only. Concurrent Mode allows you to use dual mode simultaneously. Turn Off will disable wireless, and you cannot associate with AP through wireless.




## Wireless Basic Page

This page allows you to configure basic features of your Wi-Fi wireless network. You can enable or disable the wireless interface, hide the network from active scans, set the wireless network name (also known as SSID) and select the working channel.




### Field Descriptions for the Wireless Basic Page

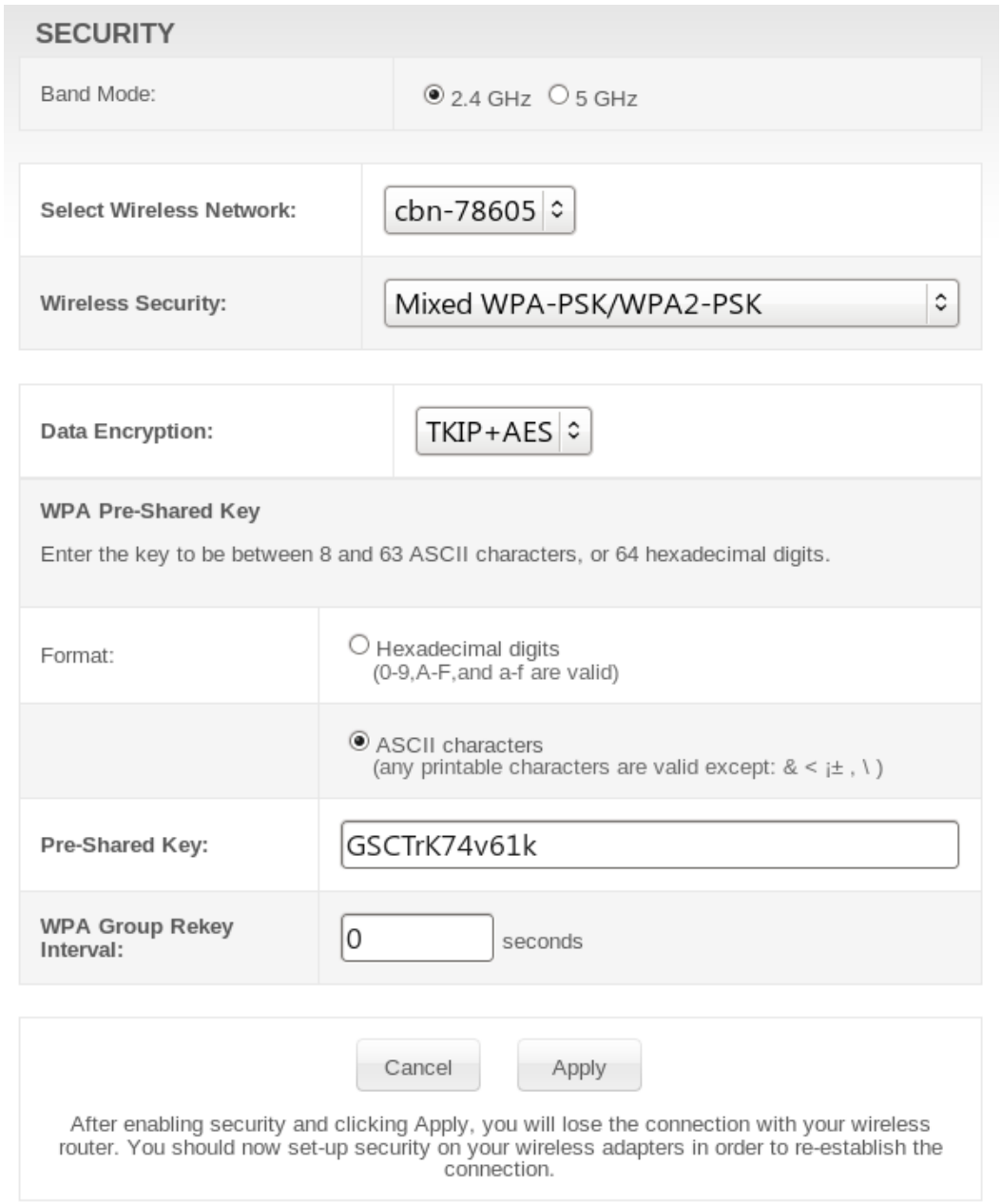
| Field | Description |
|---|---|
| **Band Mode** | Select the band mode you want to setting, and this option appear only on Concurrent Mode. |
| **SSID** | Sets the Network Name (also known as SSID) of the Primary wireless network. This is a 1-32 ASCII character string. |
| **Hide Network** | With a hide network, users type the SSID into the client application instead of selecting the SSID from a list. This feature makes it slightly more difficult for the user to gain access. |
| **WMM** | Enabling WMM can help control latency and jitter when transmitting multimedia content over a wireless connection. |
| **Bridge** | When the check box set, indicates network traffic from which particular wireless interface will be bridged to HFC interface. When the checkbox cleared, indicates network traffic from which particular wireless interface will be handled by Gateway routing features. |
| **Transmission Mode** | Select which 802.11 mode is used by CH6643E, including 802.11b/g/n mixed mode, 802.11g/n mixed mode, 802.11n only, 802.11b/g mixed mode, 802.11g only, for 802.11b only in 2.4G band mode, 802.11a/n mixed mode, 802.11a only, 802.11n only in 5G band mode. |
| **Transmission Rate** | Select 802.11 physical transmission rate, this value depends on Transmission Mode. If “Transmission Mode” is “802.11n only” and “802.11n Rate” is selected, the menu of MCS is provided |

| Field | Description |
|---|---|
| | and depends on whether a 20 MHz channel or 40 MHz channel is being used. |
| **Maximum Station Number** | Sets this field to limit the number of clients which allow connecting to this SSID and this is a number between 0 and 16. Set to 0 indicates no limitation. |
| **Enable** | Enable or disable this wireless interface. |
| **Channel Width** | Select the channel width (20 MHz or 20/40 MHz) to be used by CH6643E. When 20/40MHz is selected 802.11n clients experience improved throughput using 40 MHz, while legacy clients(either 802.11a or 802.11b/g) can still be serviced without interruption using 20MHz. |
| **Control Sideband** | Specify if the extension channel should be in the Upper or Lower sideband. This field is only shown when “Channel Width” is set to 20/40 MHz. |
| **Primary Channel** | Select primary (control) channel is in the lower or upper 20 MHz band of the bonded 40 MHz channel. |
| **Channel** | Select the current channel number or control channel, you can select “Select Best Quality Channel Automatically” check box to auto select one, this value depend on Transmission Mode. |
| **Multicast Rate** | Select the physical layer transmission rate used for Multicast traffic on the wireless interface, this value depend on Transmission Mode. |

# Wireless Security Page

This page allows you to protect your Wi-Fi wireless network by specifying WEP, 802.1x, WPA, or WPA2 wireless security. Before setting up security, ensure that your wireless adaptors support the same type of security.

The default type of security is Mixed WPA-PSK/WPA2-PSK. Field of Mixed WPA-PSK/WPA2-PSK, WPA2-PSK and WPA-PSK are the same.

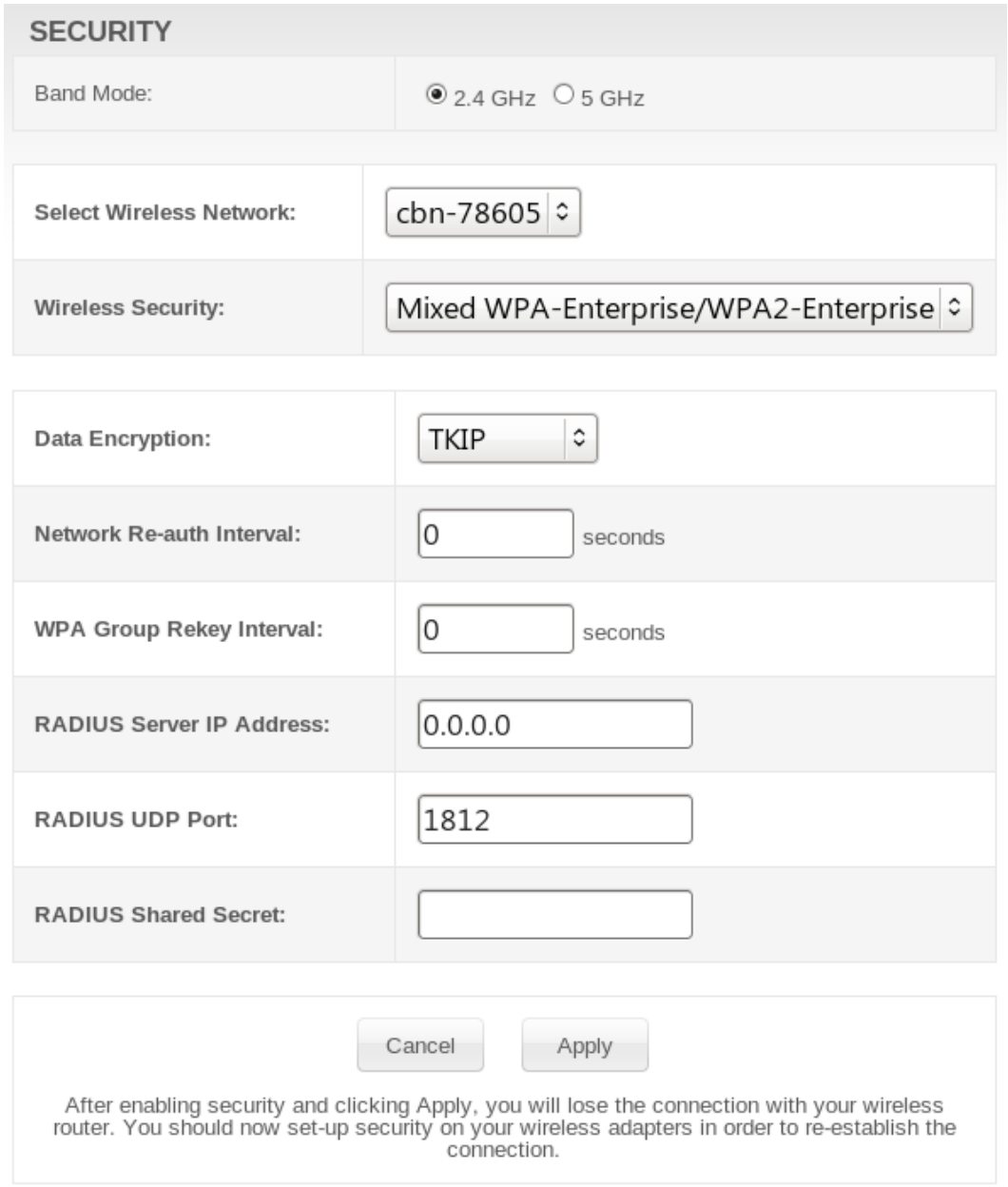



**Field Descriptions for Mixed WPA-PSK/WPA2-PSK, WPA2-PSK and WPA-PSK page**

| Field | Description |
|---|---|
| **Data Encryption** | When using WPA or WPA2 authentication, these WPA encryption modes can be set: TKIP, AES, or TKIP + AES. AES (Advanced Encryption Standard) provides the strongest encryption, while TKIP (Temporal Key Integrity Protocol) provides strong encryption with improved compatibility. the TKIP + AES mode allows both TKIP and AES-capable clients to connect. |
| **Format** | Sets the format of key as hexadecimal digits or ASCII |

| Field | Description |
|---|---|
| | character. |
| **Pre-Shared Key** | Sets the WPA/WPA2 Pre-Shared Key (PSK). This is either an 8-63 ASCII character string or 64 hexadecimal digits. This is specified when the Network Authentication method is WPA-PSK or WPA2-PSK. |
| **WPA Group Rekey Interval** | Sets the WPA Group Rekey Interval in seconds. Set to zero to disable periodic rekeying. |

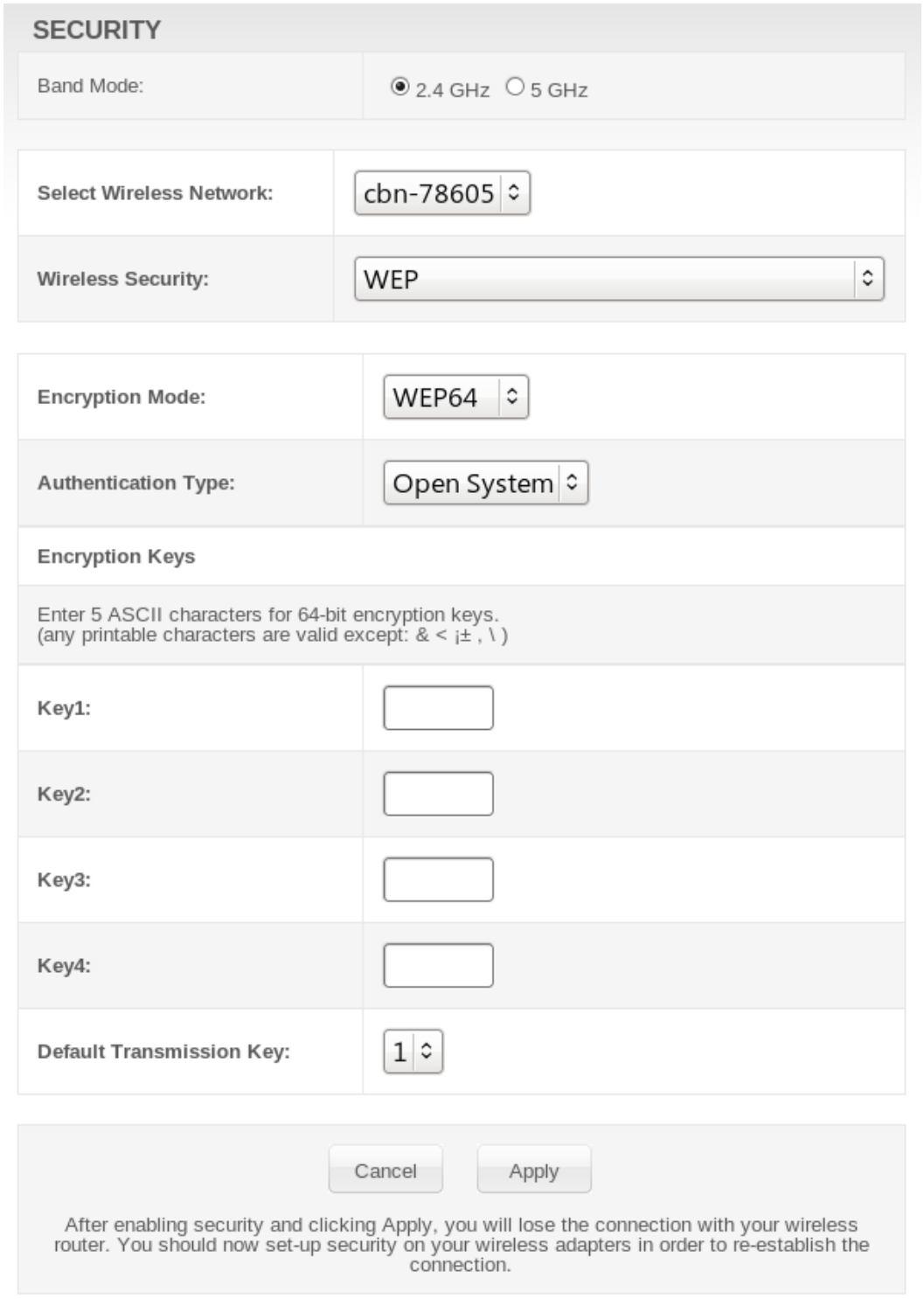
Field of Mixed WPA-Enterprise/WPA2-Enterprise, WPA-Enterprise and WPA2-Enterprise are similar.



**Field Descriptions for WPA-Enterprise/WPA2-Enterprise, WPA-Enterprise and WPA2-Enterprise Page**

| Field | Description |
|---|---|
| **Network Re-auth Interval** | The re-authentication interval is the amount of time the wireless router can wait before re-establishing authentication with the CPE (WPA-Enterprise don't have this field). |
| **RADIUS Server IP Address** | Sets the RADIUS server IP address to use for client authentication using the dotted-decimal format (xxx.xxx.xxx.xxx). |
| **RADIUS UDP Port** | Sets the UDP port number of the RADIUS server. The default is 1812. |
| **RADIUS Shared Secret** | Sets the shared secret for the RADIUS connection. The key is a 0 to 255 character ASCII string. |

WEP encryption:

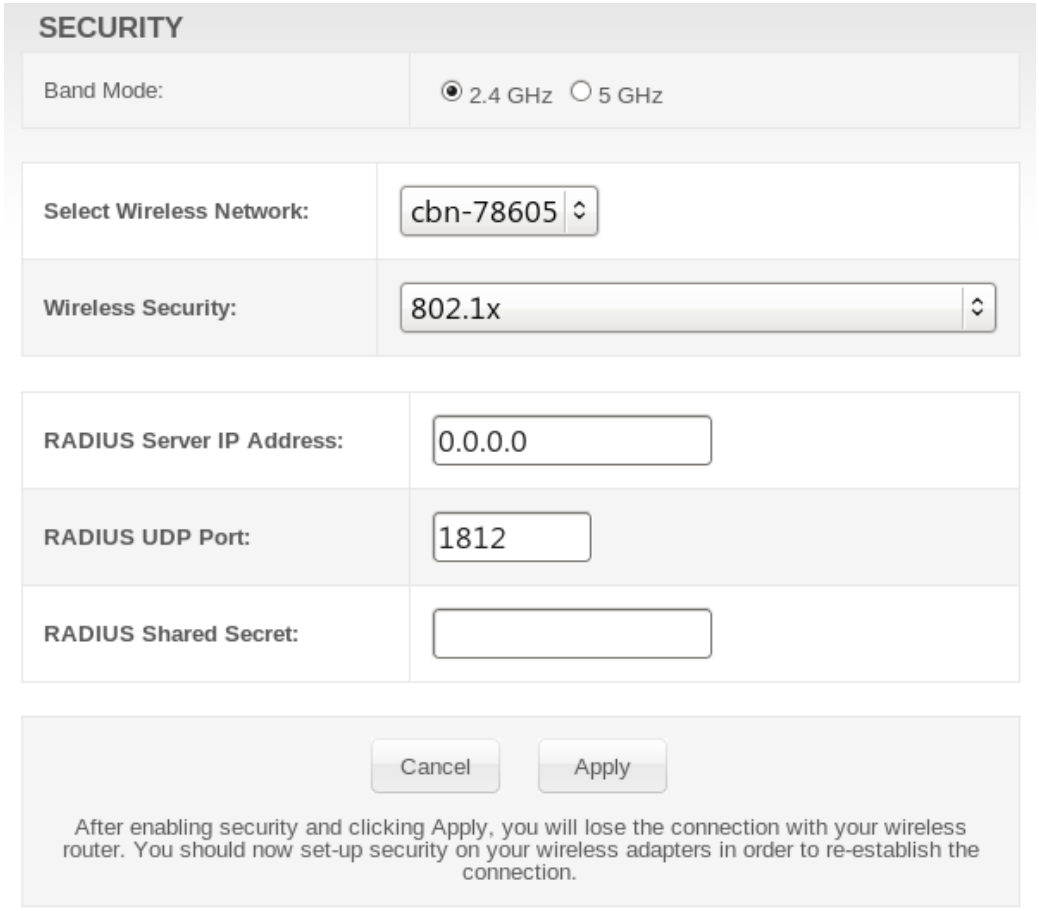



### Field Descriptions for the WEP Page

| Field | Description |
|---|---|
| **Encryption Mode** | The CPE uses either the 64-bit or 128-bit key to encrypt the challenge text and sends the encrypted text to the access |

| Field | Description |
|---|---|
| | point. The access point will decrypt the encrypted text and then compare the decrypted message with the original challenge text. If they are the same, the access point will let the CPE connect; if it doesn't match, then the access point does not let the CPE connect. |
| **Authentication Type** | Select the use of Shared Key authentication in WEP protocol. If select Auto, Shared Key authentication is optional. If select Shared Key, the Shared Key authentication is required for WEP. |
| **Key 1 – 4** | Sets the static WEP keys when WEP encryption is enabled.<br>• Enter 5 ASCII characters for a 64-bit key.<br>• Enter 13 ASCII characters for a 128-bit key. |
| **Default Transmission Key** | Selects the transmission key when WEP encryption is enabled. |

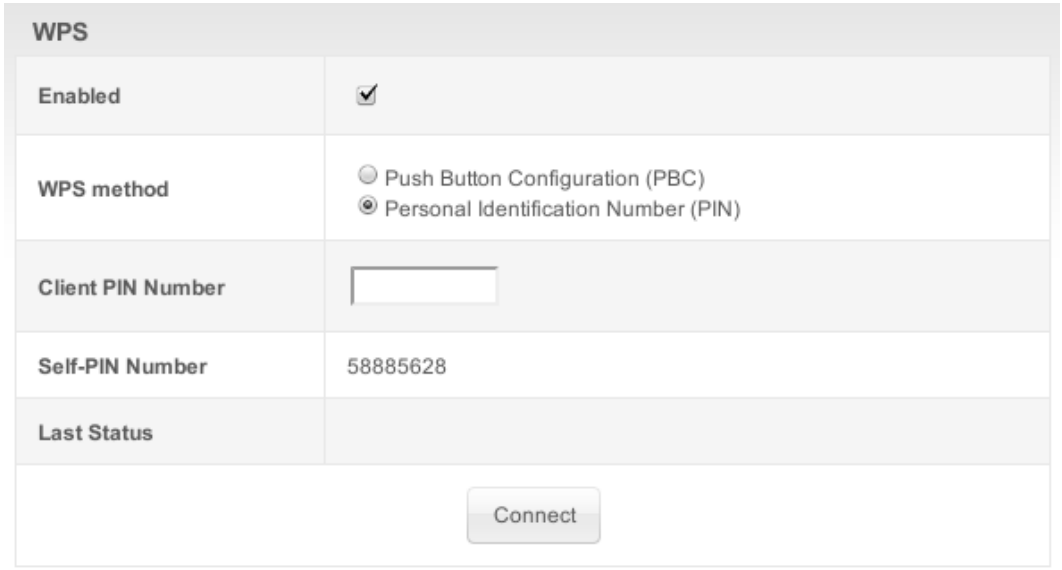
802.1x encryption:




This is another type of authentication and is used on top of WEP. 802.1x Authentication is a much stronger type of authentication than WEP. About field description you can refer to tables above.

# Wireless WPS Page

CH6643E provide WPS (Wi-Fi Protected Setup) function, with it enable will support WPS clients to join the network very easily. It is a standard for easy and secure establishment of a wireless network. With WPS you can setup and protect your wireless network in just a few easy steps.




**Field Descriptions for the Wireless WPS Control Page**

| Field | Description |
|---|---|
| **Enable** | Enable or disable WPS. |
| **WPS method** | There are two common ways to establish WPS connection in CH6643E:<br><br>1. Push Button Configuration (PBC): If this option selected, you can press the “Connect” button below then push the WPS button on your wireless device (either an actual one or a virtual one) within 120 seconds to start the handshaking.<br><br>2. Personal Identification Number (PIN): A PIN filed will appear if this option selected, enter the PIN code from your wireless device and click the below “Connect” button to start the handshaking |
| **PIN** | Enter PIN code of wireless device. |
| **Gateway PIN** | CH6643E gateway’s PIN code, |

The step of WPS establishment:

- PBC

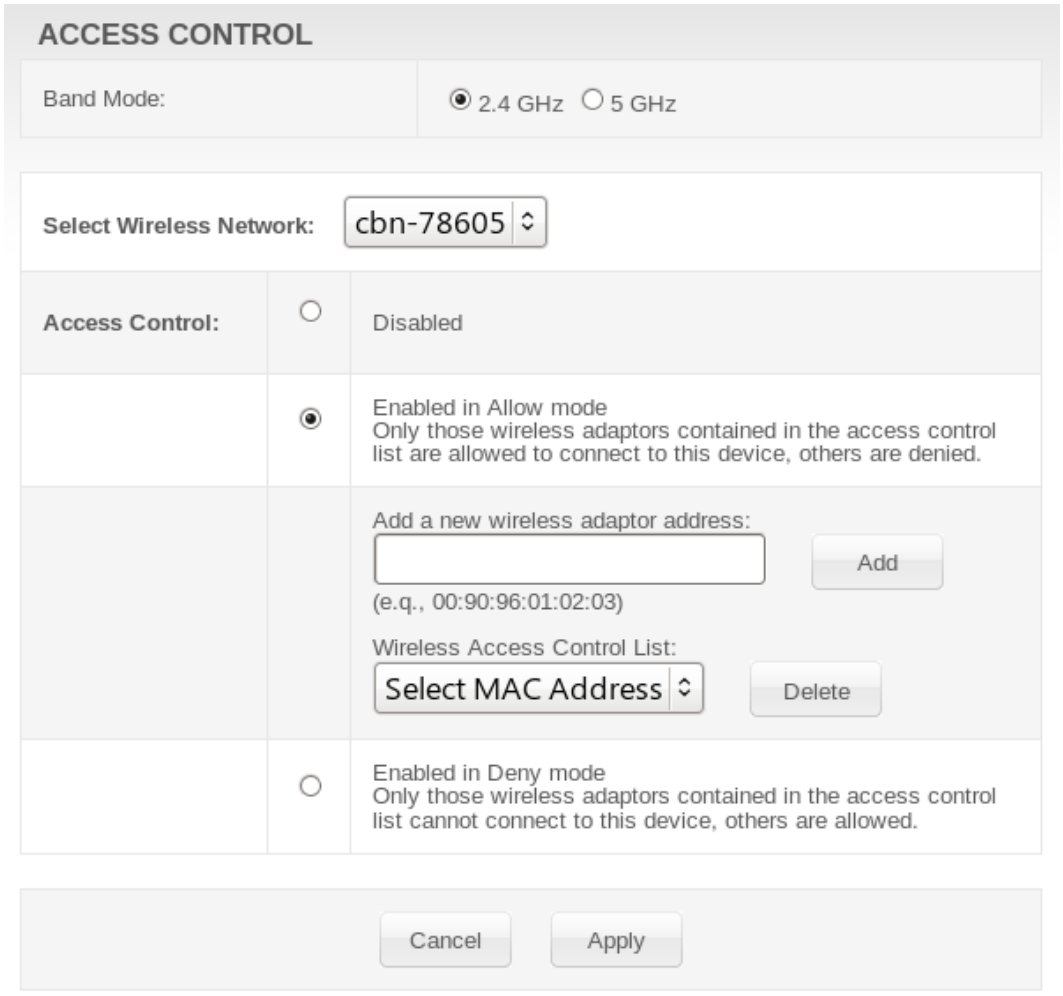
1. Click or press the WPS button on the CH6643E's front panel or select Push Button Configuration (PBC) option radio then click "Connect" button in the web page "Home / Gateway / Wireless / WPS", the wireless LED will flash with orange color.
2. Click or press the WPS button on the wireless device within 120 seconds.
3. If WPS connection successfully established, the wireless LED will turn green.

- PIN
  1. In web page "Home / Gateway / Wireless / WPS", select Personal Identification Number (PIN) option radio then a "PIN" column will appear.
  2. Enter the wireless device's PIN code that is normally printed on the device's sticker or generated by connection manager of that device.
  3. Click "Connect", then the wireless LED will flash with orange color.
  4. Start PIN registration process by connection manager of that device within 120 seconds.
  5. If WPS connection successfully established, the wireless LED will turn green.

The countdown timer will start after you click "Connect" button

# Wireless Access Control Page

This page allows you to configure the Access Control to the AP on the connected clients.

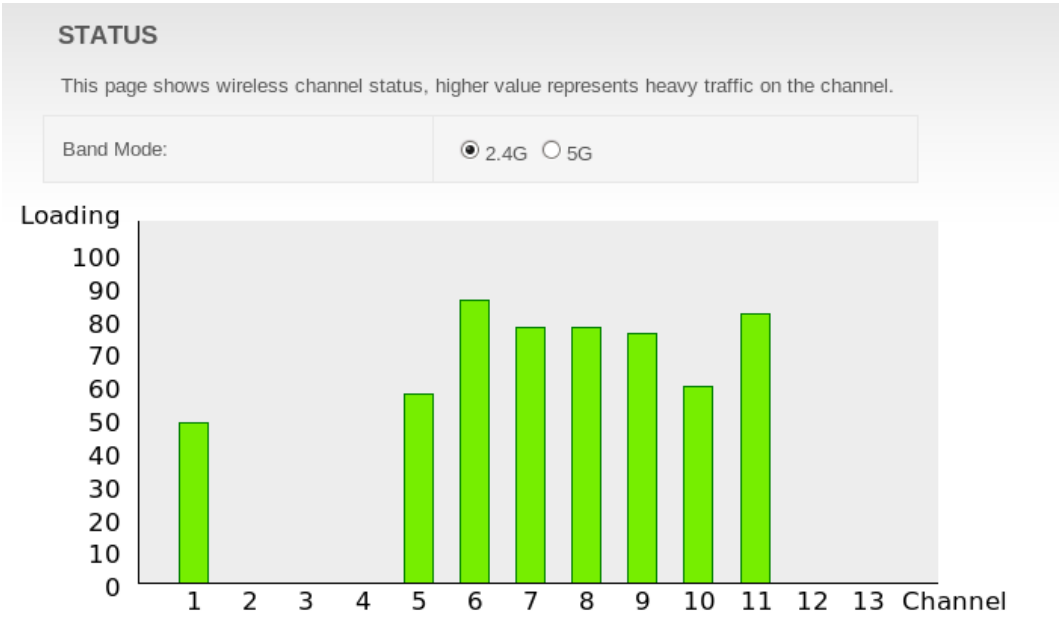

ACCESS CONTROL
Band Mode:
2.4 GHz
5 GHz
Select Wireless Network:
cbn-78605
Access Control:
Disabled
Enabled in Allow mode
Only those wireless adaptors contained in the access control list are allowed to connect to this device, others are denied.
Add a new wireless adaptor address:
Add
(e.g., 00:90:96:01:02:03)
Wireless Access Control List:
Select MAC Address
Delete
Enabled in Deny mode
Only those wireless adaptors contained in the access control list cannot connect to this device, others are allowed.
Cancel
Apply

**Field Descriptions for the Wireless Access Control Page**

| Field | Description |
|---|---|
| **Access Control** | Select “Disable” to disable access control<br>Select Enabled in Allow mode then you can maintain a list of client allowed to connect to this device.<br>Select Enabled in Deny mode then you can maintain a list of client cannot to connect to this device. |

# Wireless Status Page

This page show a histogram to represent wireless channel status on your environment, channel loading value between 0~100, higher value represents heavy traffic on this channel. For example: value 0 means no network traffic transmits on this channel, value 100 means the channel is heavy congested.




If you encounter the situation of wireless throughput degraded or slow response of network transmission, you may consider choosing a less congested channel base on the information provided by this page, and change you wireless channel on Wireless Basic Page.

# Setting Up Your Wireless LAN

You can use the CH6643E as an access point for a wireless LAN (WLAN) without changing its default settings.

To enable security for your WLAN, you can do the following on the CH6643E:

- Encrypt wireless LAN transmissions
- Restrict wireless LAN access to further prevent unauthorized WLAN intrusions using the Wireless Access Control Page

> ***CAUTION:*** *Never provide your SSID, WPA or WEP passphrase, or WEP key to anyone who is not authorized to use your WLAN.*

Connect at least one computer to the CH6643E Ethernet port to perform configuration. Do not attempt to configure the CH6643E over a wireless connection.

You need to configure each wireless client (station) to access the CH6643E LAN.

Another step to improve wireless security is to place wireless components away from windows. This decreases the signal strength outside the intended area.

# Encrypting Wireless LAN Transmissions

To prevent unauthorized viewing of data transmitted over your WLAN, you must encrypt your wireless transmissions. Choose one of the following:

**Encrypting Wireless LAN Transmissions**

| Configure on the CH6643E | Required on Each Wireless Client |
|---|---|
| **if all of your wireless clients support Wi-Fi Protected Access (WPA), recommending configuring WPA on the CH6643E** | If you use a local pre-shared key (WPA-PSK) passphrase, you must configure the identical passphrase on the CH6643E and on each wireless client. Home and small-office settings typically use a local passphrase. |
| **Otherwise, configure WEP on the CH6643E** | You must configure the identical WEP key on the CH6643E and on each wireless client. |

If all of your wireless clients support WPA encryption, recommending using WPA instead of WEP because WPA:

- Provides much stronger encryption and is more secure
- Provides authentication to ensure that only authorized users can log in to your WLAN
- Is much easier to configure
- Uses a standard algorithm on all compliant products to generate a key from a textual passphrase
- Will be incorporated into the new IEEE 802.11i wireless networking standard

For new wireless LANs, recommending purchasing client adapters that support WPA encryption.

# 8 GATEWAY USB Pages

The CH6643E support a variety of USB devices including printer and storage. You can plug USB printers and storages on the device and share them through internet.

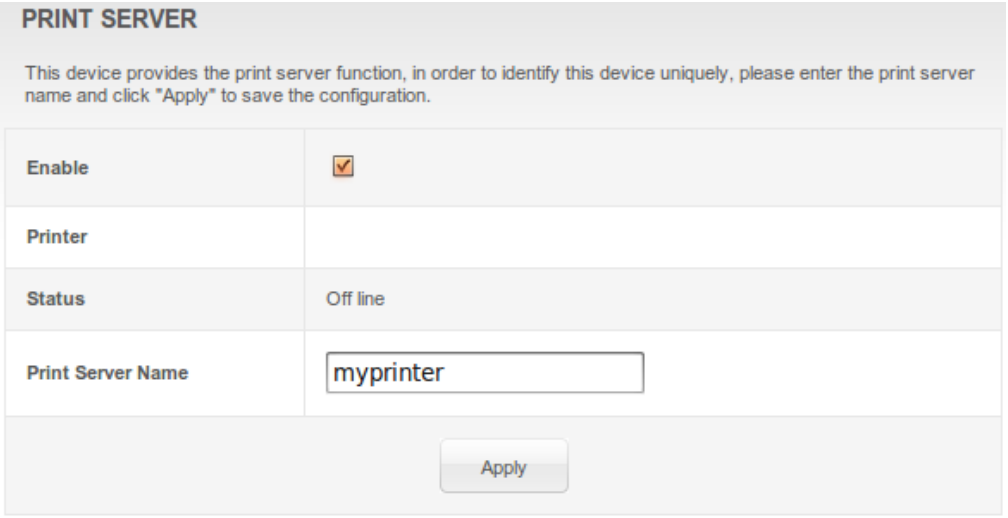
PRINT SERVER

FTP SERVER

FILE SERVER

## Print Server

CH6643E support USB printer and share it based on Internet Printing Protocol (IPP) protocol that allow users connect and manage print jobs


PRINT SERVER
This device provides the print server function, in order to identify this device uniquely, please enter the print server name and click "Apply" to save the configuration.
Enable
Printer
Status
Off line
Print Server Name
myprinter
Apply

**Field Descriptions for the Print Server Page**

| Field | Description |
|---|---|
| **Enable** | Enable or disable print server. |
| **Printer** | The printer's name. |
| **Status** | Status of the printer, maybe idle, busy, off-line or out-of-paper. |
| **Print Server Name** | The share name set by server let users can connect. |

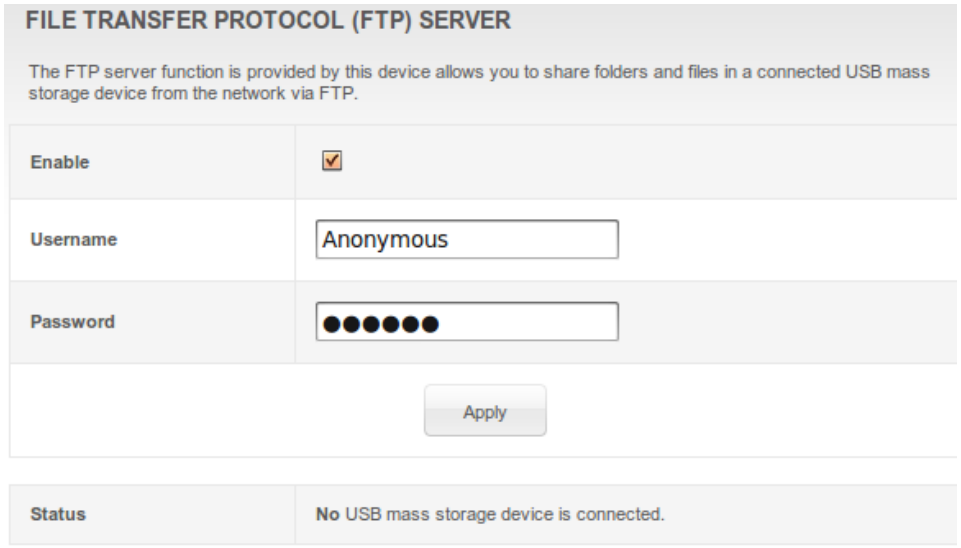
Step of connect print server on windows client:

1. Open the Add Printer Wizard either by going via Start > Settings > Printers and Faxes, or by opening Printers and Faxes and clicking the Add Printer icon.

2. After clicking "Add Printer", click the next button and configure this as a network printer. Click Next.
3. Click on "Connect to a printer on the Internet or on a home or office network" and set the address to "http://print:631/printers/myprinter".Click Next.
4. The wizard will prompt you to select a driver for your printer.
5. If all went well, you should see complete window. Click Finish.

## FTP Server

CH6643E support USB storage and share it based on FTP (File Transfer Protocol) that allows users can login and manage it.


FILE TRANSFER PROTOCOL (FTP) SERVER
The FTP server function is provided by this device allows you to share folders and files in a connected USB mass storage device from the network via FTP.
Enable
Username
Anonymous
Password
Apply
Status
No USB mass storage device is connected.

**Field Descriptions for the FTP Server Page**

| Field | Description |
|---|---|
| **Enable** | Enable or disable FTP server. |
| **Username** | The login username of ftp server. |
| **Password** | The login password of ftp server. |
| **Status** | Show vender and model info of the USB stick. |

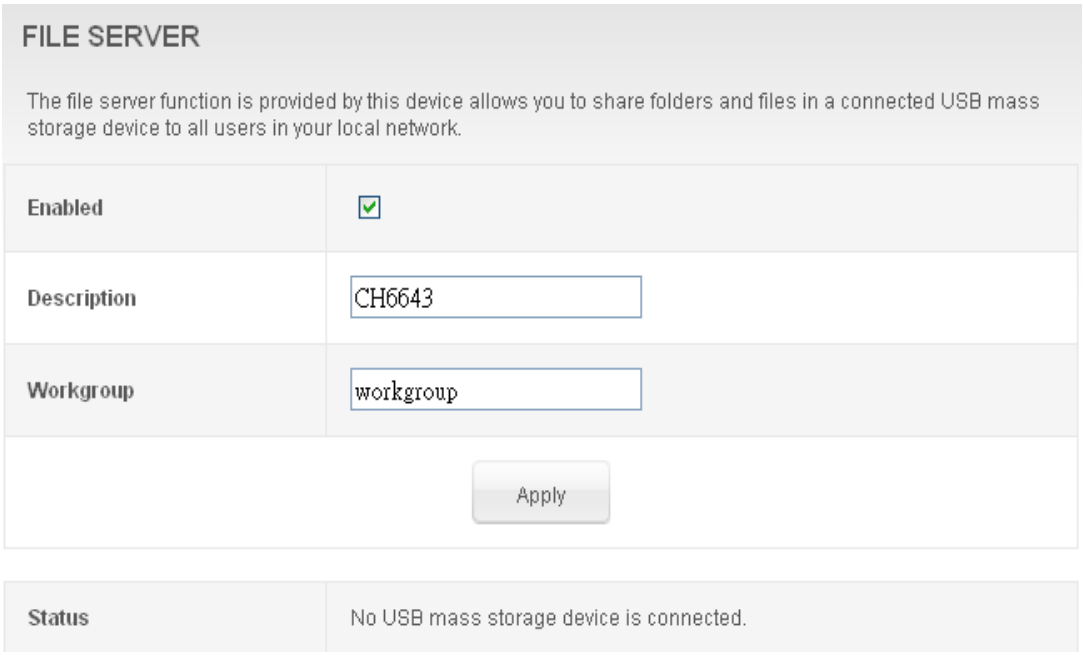
Step of connect FTP server on windows client:

1. Open the “Windows Explorer” or double click “My Computer” icon on desktop.
2. Enter ftp://192.168.0.1/ in the address field and press **ENTER.**
3. Enter username and password in the prompt windows if the login username is not Anonymous.
4. The root directory of multiple USB mass storages are displayed in the browser, double click the directory you want to browser.

5. The folder structure of the USB mass storage is displayed in the file browser.

## File Server

CH6643E support USB storage and share it based on Samba service that allow users can login and manage it.


FILE SERVER
The file server function is provided by this device allows you to share folders and files in a connected USB mass storage device to all users in your local network.
Enabled
Description
CH6643
Workgroup
workgroup
Apply
Status
No USB mass storage device is connected.

**Field Descriptions for the File Server Page**

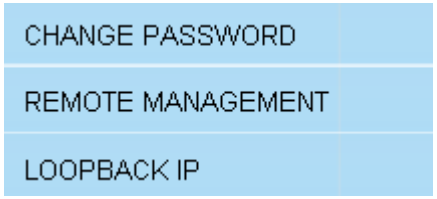
| Field | Description |
|---|---|
| **Enable** | Enable or disable File server. |
| **Description** | The server string of samba server. |
| **Workgroup** | The workgroup name that the samba server resides on. |
| **Status** | Show information about the USB stick, including vendor name, model name, per partition size and file system type. There is a “safely remove” button after stick name column to umount disk including all partition safely. |

Step of connect file server on windows client:

1. Open the “Windows Explorer” or double click “My Computer” icon on desktop.
2. Enter \\192.168.0.1 in the address field and press **ENTER.**
3. The root directory of multiple USB mass storages are displayed in the browser, double click the directory you want to browser.
4. The folder structure of the USB mass storage is displayed in the file browser.

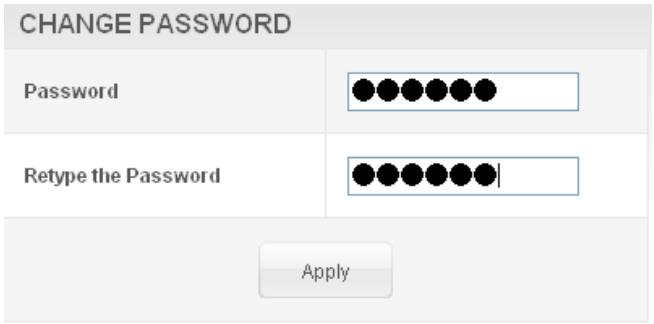
# 9 GATEWAY MANAGEMENT Pages

The CH6643E support management for web browser login password, port and enable/disable web browser. These pages are including changing password function, remote management and loopback IP function.



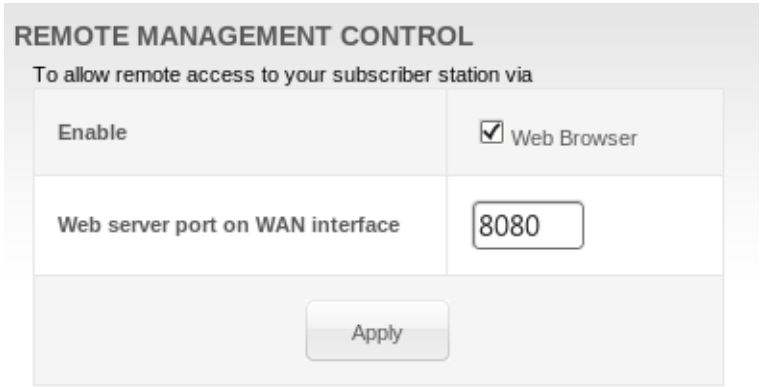

## Change Password

CH6643E allows changing `admin` password for web browser login. Configure Password and retype the Password again and then click Apply and when you login in next time, you must use this new password. For secure, we strongly suggest to change default password as soon as possible.




## Remote Management Control

Generally, only the members of your network can browse the web pages to perform administration tasks on CH6643E. Remote Management Control allows CH6643E to be configured by web browser and perform administration task from Internet.



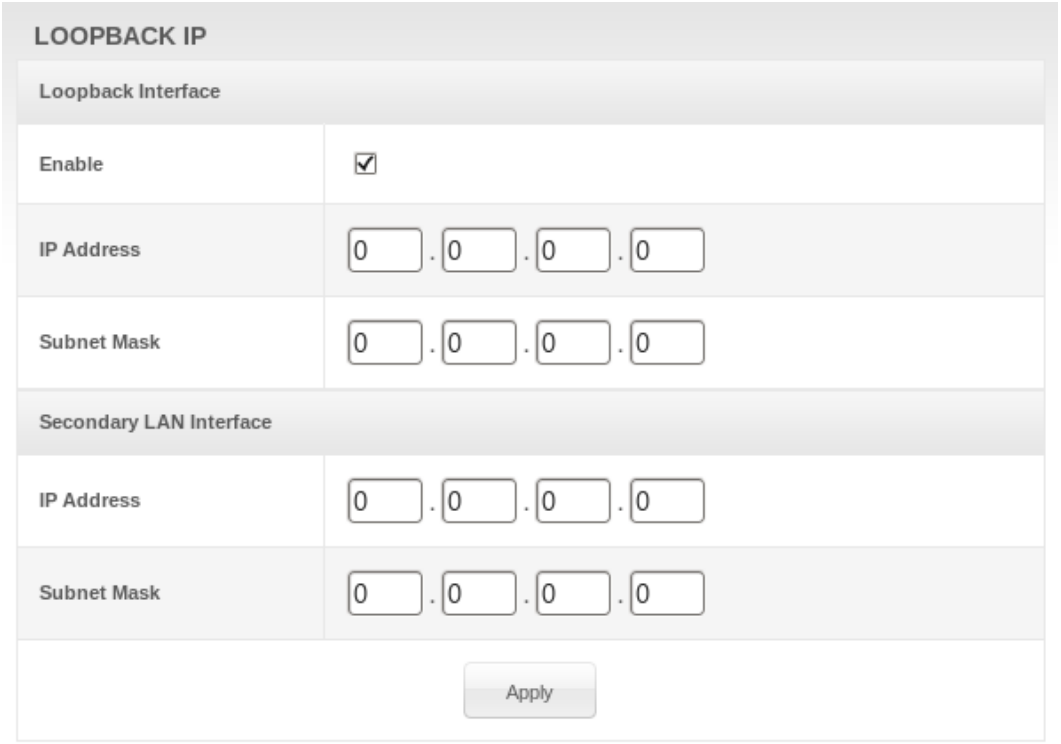
**Field Descriptions for Remote Management Control**

| Field | Description |
|---|---|
| **Enable**<br>**Web Browser** | Check the box to allow remote control by web browser. |
| **Web server port on WAN Interface** | Enter the port number of web server on WAN interface. |

After apply settings, on remote host, you can browse the web page on CH6643E with IP address on WAN interface and indicated port number, for example: http://x.x.x.x:8080. Whereas you can get IP address from GATEWAY-BASIC-SETUP page.

# Loopback IP

CH6643E allows to configure a Loopback IP on WAN for the convenience of management. Furthermore, managers can configure a static IP address, named Secondary LAN Interface, on WAN for routing purpose.




**Field Descriptions for Loopback IP and Secondary LAN Interface**

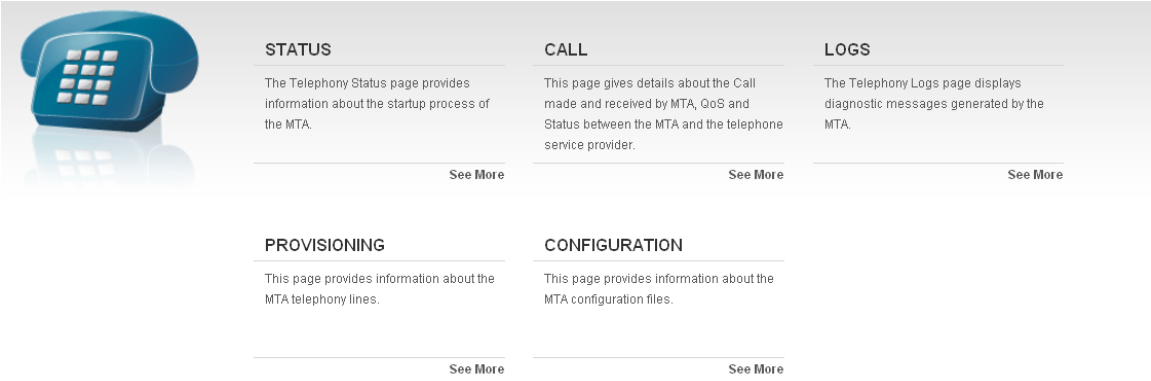
| Field | Description |
|---|---|
| **Enable** | Check the box to allow manager to configure loopback and Secondary LAN interface. |
| **Loopback Interface** | |

| Field | Description |
| --- | --- |
| **IP Address** | Enter the IP address for loopback interface. |
| **Subnet Mask** | Enter the subnet mask for loopback interface. |
| **Secondary LAN Interface** | |
| **IP Address** | Enter the IP address for the secondary LAN interface. |
| **Subnet Mask** | Enter the subnet mask for the secondary LAN interface. |

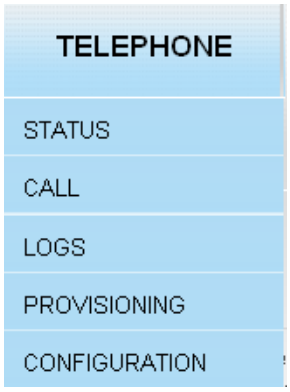
Please note that, after apply the settings successfully, NAT will be disabled.

# 10 TELEPHONE Pages

The Multimedia Terminal Adapter (MTA) in your CH6643E provides digital VoIP services, which allow you to use the Internet to make telephone calls. Basic telephone functions, such as three-way calling, voice mail, and fax transmissions, can be supported with this connection on the CH6643E.


STATUS
The Telephony Status page provides information about the startup process of the MTA.
See More
CALL
This page gives details about the Call made and received by MTA, QoS and Status between the MTA and the telephone service provider.
See More
LOGS
The Telephony Logs page displays diagnostic messages generated by the MTA.
See More
PROVISIONING
This page provides information about the MTA telephony lines.
See More
CONFIGURATION
This page provides information about the MTA configuration files.
See More

Click any TELEPHONE submenu option to view the status information for that option.



# TELEPHONE Status Page

This page displays the initialization status of the MTA.

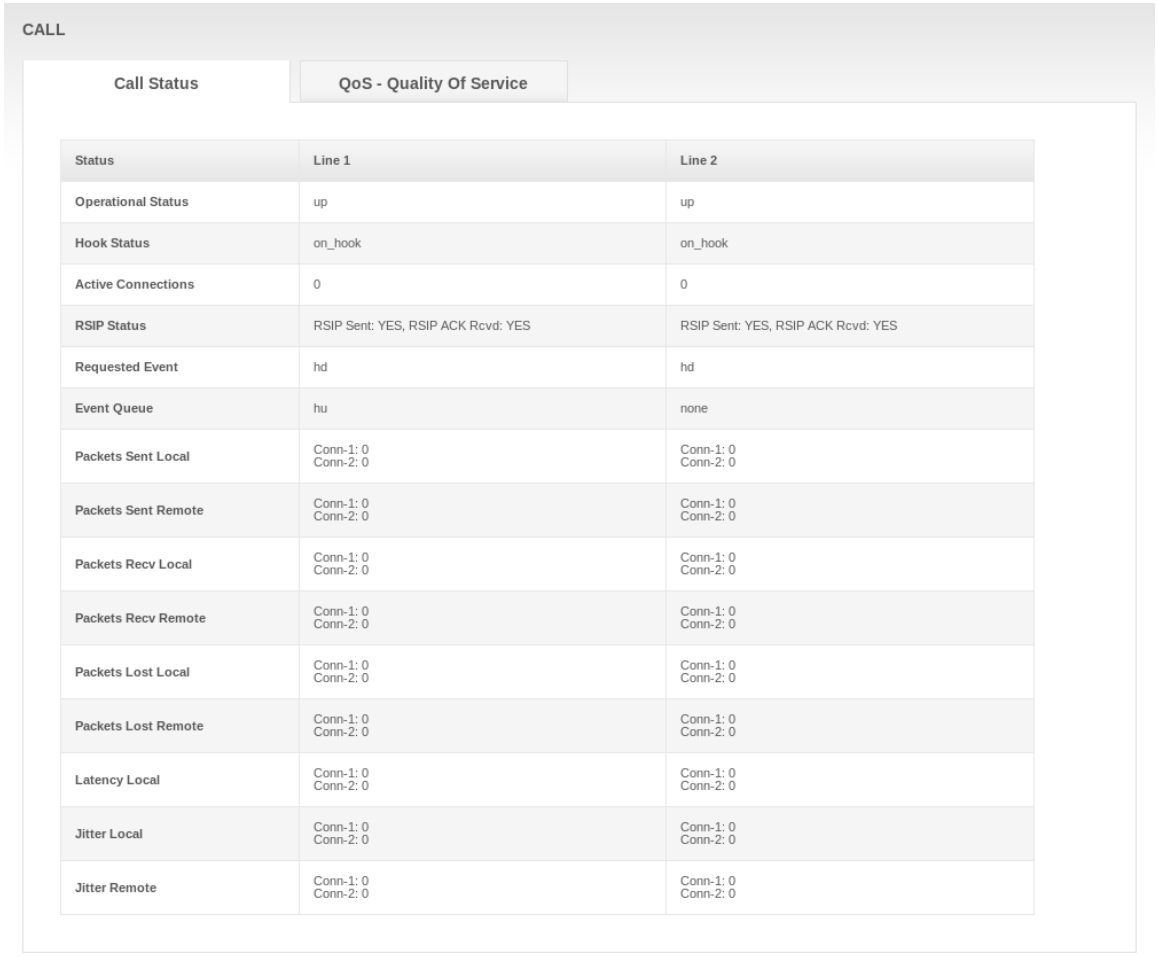
| STATUS | |
|---|---|
| Telephony DHCP | Done |
| Telephony TFTP | Done |
| Telephony Provisioning State | passed |

| TELEPHONY STATE | |
|---|---|
| Telephony Registration State Line 1 | operational |
| Telephony Registration State Line 2 | operational |

# TELEPHONE Call Page

## Call Status Tab

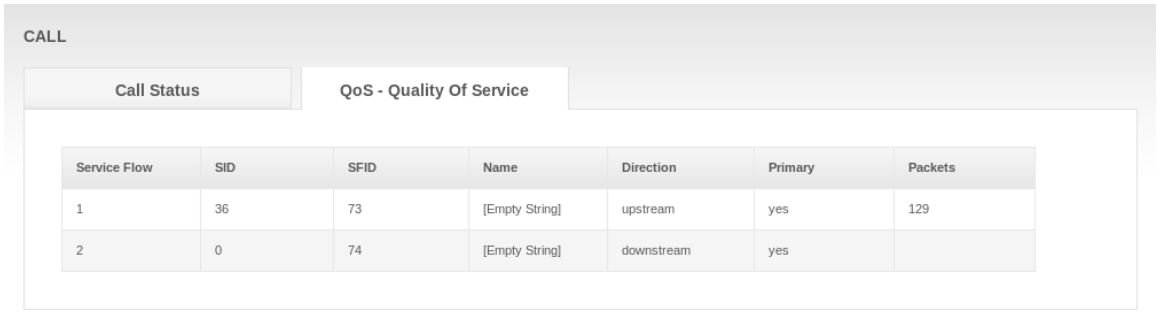
This tab displays the MTA call status.




| Status | Line 1 | Line 2 |
|---|---|---|
| Operational Status | up | up |
| Hook Status | on_hook | on_hook |
| Active Connections | 0 | 0 |
| RSIP Status | RSIP Sent: YES, RSIP ACK Rcvd: YES | RSIP Sent: YES, RSIP ACK Rcvd: YES |
| Requested Event | hd | hd |
| Event Queue | hu | none |
| Packets Sent Local | Conn-1: 0<br>Conn-2: 0 | Conn-1: 0<br>Conn-2: 0 |
| Packets Sent Remote | Conn-1: 0<br>Conn-2: 0 | Conn-1: 0<br>Conn-2: 0 |
| Packets Recv Local | Conn-1: 0<br>Conn-2: 0 | Conn-1: 0<br>Conn-2: 0 |
| Packets Recv Remote | Conn-1: 0<br>Conn-2: 0 | Conn-1: 0<br>Conn-2: 0 |
| Packets Lost Local | Conn-1: 0<br>Conn-2: 0 | Conn-1: 0<br>Conn-2: 0 |
| Packets Lost Remote | Conn-1: 0<br>Conn-2: 0 | Conn-1: 0<br>Conn-2: 0 |
| Latency Local | Conn-1: 0<br>Conn-2: 0 | Conn-1: 0<br>Conn-2: 0 |
| Jitter Local | Conn-1: 0<br>Conn-2: 0 | Conn-1: 0<br>Conn-2: 0 |
| Jitter Remote | Conn-1: 0<br>Conn-2: 0 | Conn-1: 0<br>Conn-2: 0 |

## Quality Of Service Tab

This tab displays the MTA Quality of Service (QoS) parameters.

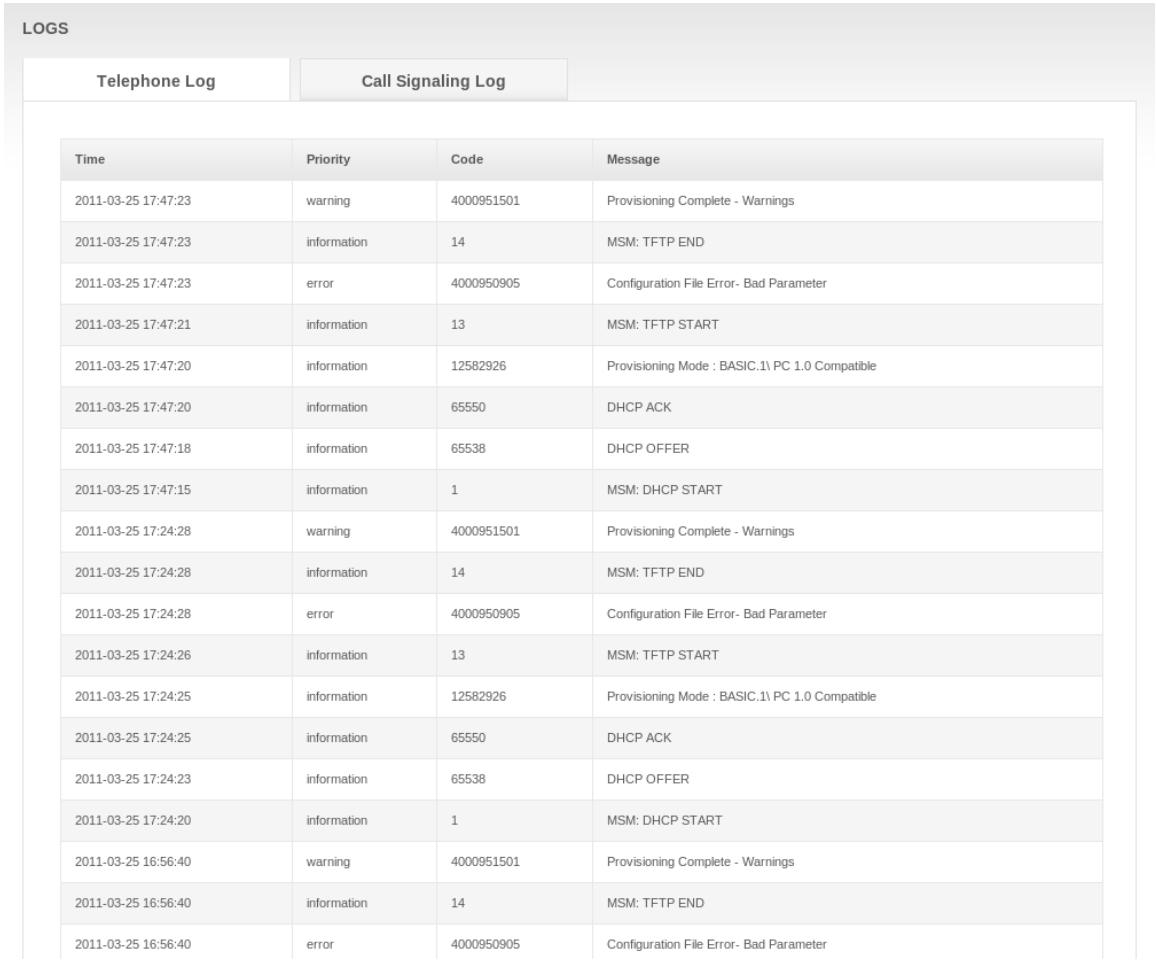



| Service Flow | SID | SFID | Name | Direction | Primary | Packets |
|---|---|---|---|---|---|---|
| 1 | 36 | 73 | [Empty String] | upstream | yes | 129 |
| 2 | 0 | 74 | [Empty String] | downstream | yes | |

# TELEPHONE Logs Page

## Telephone Log Tab

This tab displays the Telephone Log information related to your CH6643E VoIP telephone connection. It shows Diagnostic messages generated by the MTA. This information is intended for use by a qualified technician.




| Time | Priority | Code | Message |
|---|---|---|---|
| 2011-03-25 17:47:23 | warning | 4000951501 | Provisioning Complete - Warnings |
| 2011-03-25 17:47:23 | information | 14 | MSM: TFTP END |
| 2011-03-25 17:47:23 | error | 4000950905 | Configuration File Error- Bad Parameter |
| 2011-03-25 17:47:21 | information | 13 | MSM: TFTP START |
| 2011-03-25 17:47:20 | information | 12582926 | Provisioning Mode : BASIC.1\ PC 1.0 Compatible |
| 2011-03-25 17:47:20 | information | 65550 | DHCP ACK |
| 2011-03-25 17:47:18 | information | 65538 | DHCP OFFER |
| 2011-03-25 17:47:15 | information | 1 | MSM: DHCP START |
| 2011-03-25 17:24:28 | warning | 4000951501 | Provisioning Complete - Warnings |
| 2011-03-25 17:24:28 | information | 14 | MSM: TFTP END |
| 2011-03-25 17:24:28 | error | 4000950905 | Configuration File Error- Bad Parameter |
| 2011-03-25 17:24:26 | information | 13 | MSM: TFTP START |
| 2011-03-25 17:24:25 | information | 12582926 | Provisioning Mode : BASIC.1\ PC 1.0 Compatible |
| 2011-03-25 17:24:25 | information | 65550 | DHCP ACK |
| 2011-03-25 17:24:23 | information | 65538 | DHCP OFFER |
| 2011-03-25 17:24:20 | information | 1 | MSM: DHCP START |
| 2011-03-25 16:56:40 | warning | 4000951501 | Provisioning Complete - Warnings |
| 2011-03-25 16:56:40 | information | 14 | MSM: TFTP END |
| 2011-03-25 16:56:40 | error | 4000950905 | Configuration File Error- Bad Parameter |

## Call Signaling Log Tab

This tab displays the log of call signaling messages which are exchanged during MTA initialization, call creation and deletion.

LOGS

Telephone Log | Call Signaling Log

**Message sent 2011-03-29 13:45:17**

Sending(PB)[len=17][172.16.1.33:2427]:

200 350656546 OK

**Message received 2011-03-29 13:45:17**

CAIF: Received MSG from 172.16.1.33:97b, msg: RQNT 350656546 aaln/1@[172.16.35.75] MGCP 1.0 NCS 1.0

X: 1

R: hd

**Message received 2011-03-29 13:45:17**

CAIF: Received MSG from 172.16.1.33:97b, msg: 200 569 Rsip OK

**Message sent 2011-03-29 13:45:17**

Sending(PB)[len=17][172.16.1.33:2427]:

200 350656545 OK

**Message received 2011-03-29 13:45:17**

CAIF: Received MSG from 172.16.1.33:97b, msg: RQNT 350656545 aaln/1@[172.16.35.75] MGCP 1.0 NCS 1.0

X: 1

R: hd

**Message received 2011-03-29 13:45:17**

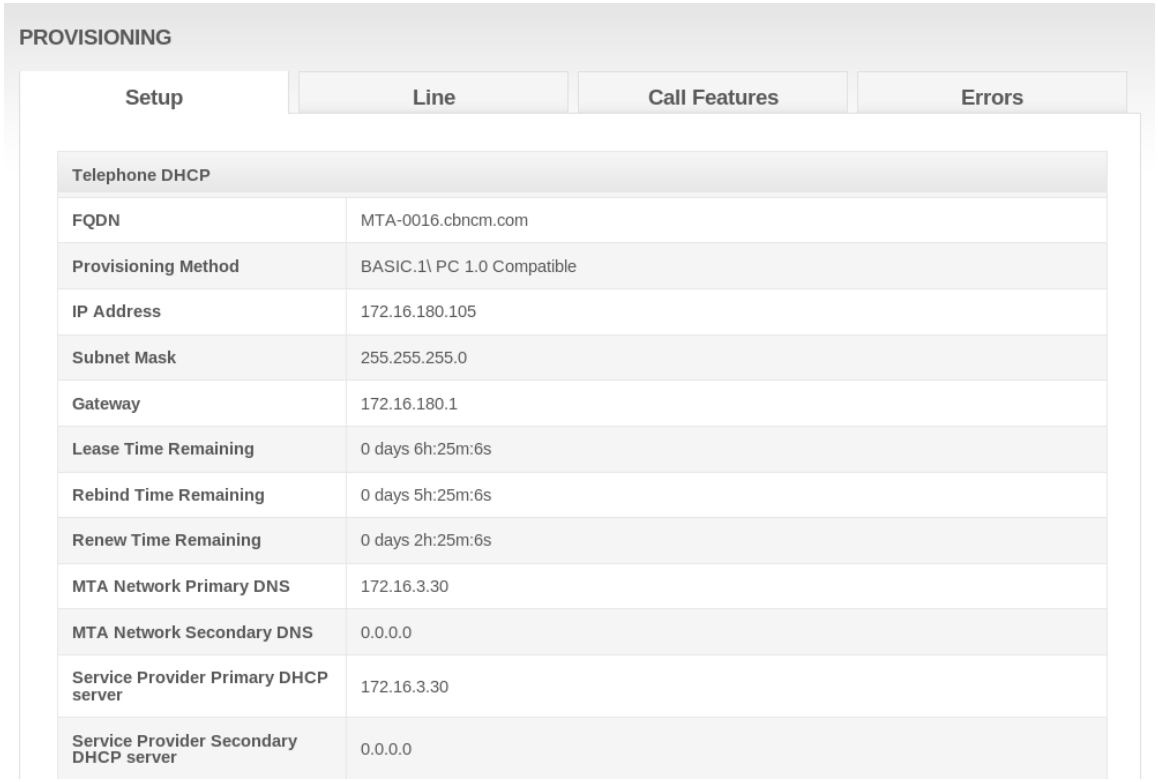
CAIF: Received MSG from 172.16.1.33:97b, msg: 200 569 Rsip OK

# TELEPHONE Provisioning Page

This page contains the MTA provisioning details about your CH6643E VoIP telephone connection (PROVISIONING item only appears in operator mode).

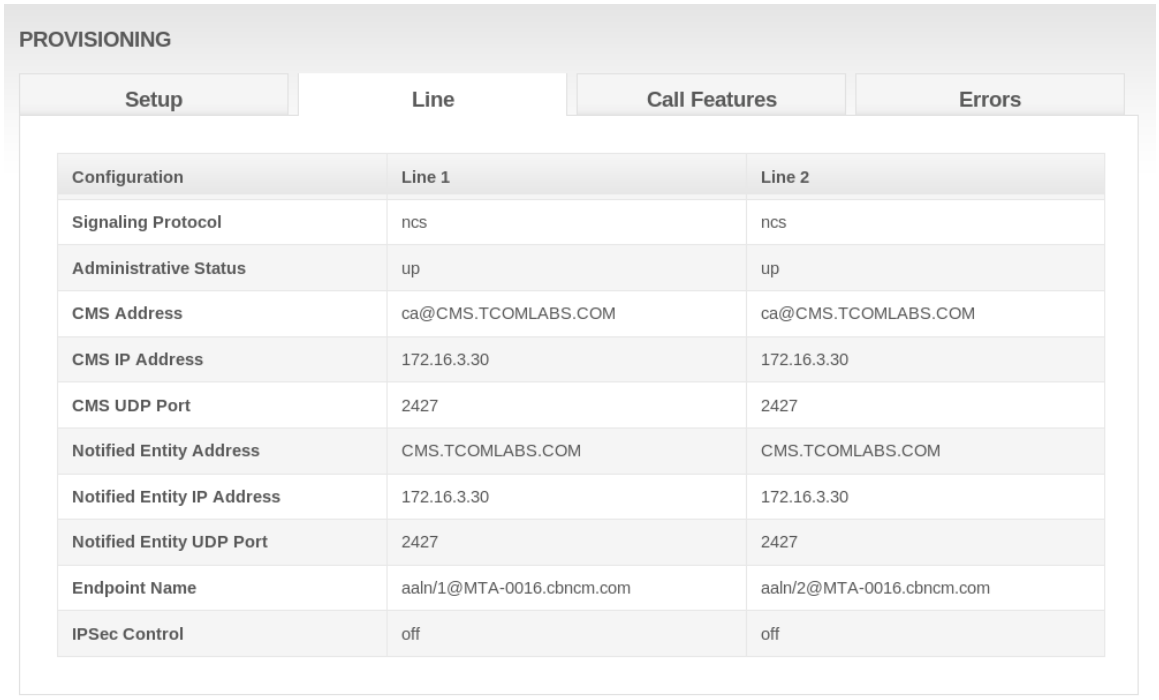
## Setup Tab

This tab displays the primary parameters for MTA provisioning, including MTA FQDN, Provisioning Method, MTA IP Address, Mask and Gateway, DNS server, Configuration File, Provisioning State and so on.



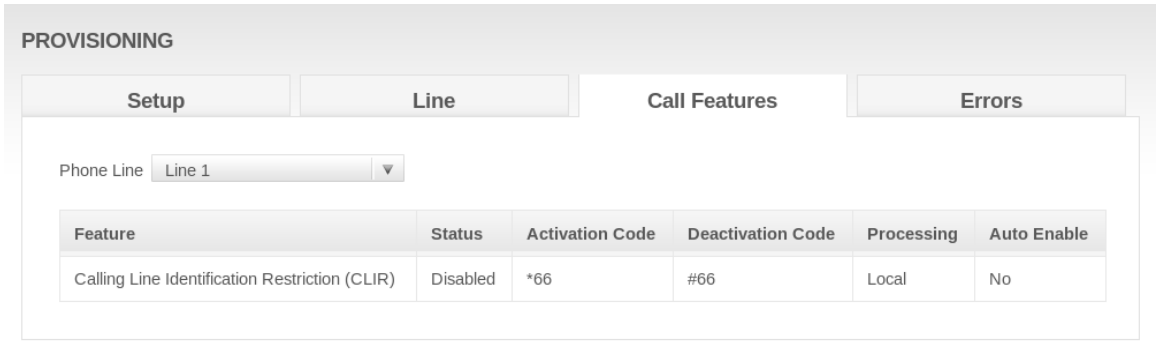

## Line Tab

This tab displays the configurations for each phone line, respectively, including Signaling Protocol, CMS Address, Endpoint Name and so on.



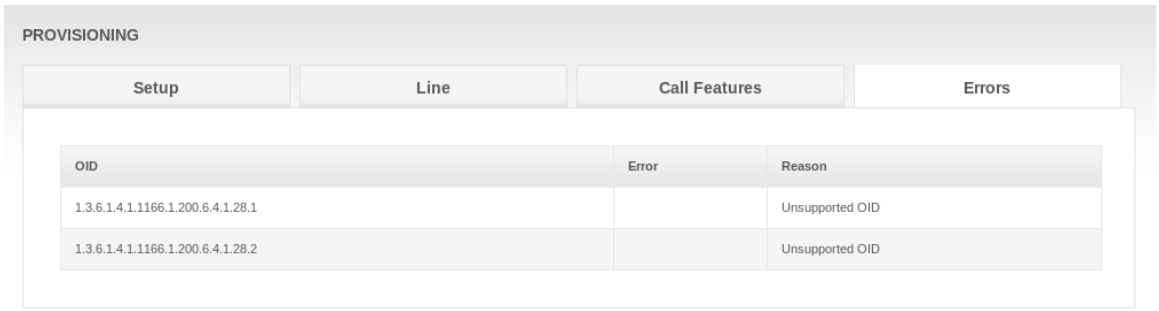

## Call Features Tab

If your ISP supports call features for SIP, this tab will list all call features for each phone line respectively.



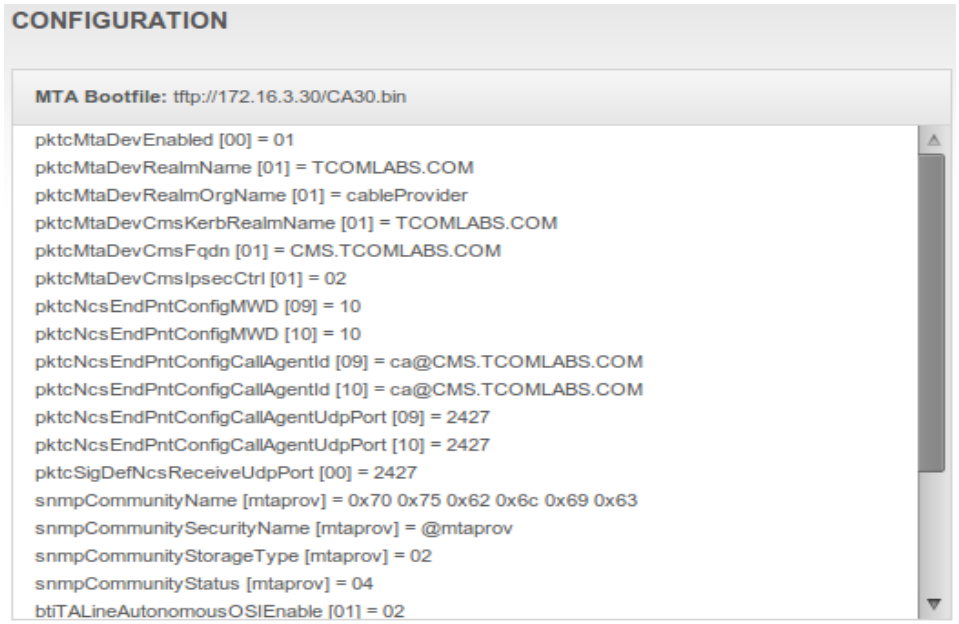

## Errors Tab

This tab displays the error items in MTA configuration.



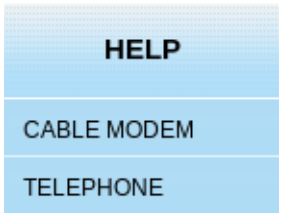
# TELEPHONE Configuration Page

This page shows the configuration file received from provider of cable broadband service. (CONFIGURATION item only appears in operator mode)


CONFIGURATION
MTA Bootfile: tftp://172.16.3.30/CA30.bin
pktcMtaDevEnabled [00] = 01
pktcMtaDevRealmName [01] = TCOMLABS.COM
pktcMtaDevRealmOrgName [01] = cableProvider
pktcMtaDevCmsKerbRealmName [01] = TCOMLABS.COM
pktcMtaDevCmsFqdn [01] = CMS.TCOMLABS.COM
pktcMtaDevCmsIpsecCtrl [01] = 02
pktcNcsEndPntConfigMWD [09] = 10
pktcNcsEndPntConfigMWD [10] = 10
pktcNcsEndPntConfigCallAgentId [09] = ca@CMS.TCOMLABS.COM
pktcNcsEndPntConfigCallAgentId [10] = ca@CMS.TCOMLABS.COM
pktcNcsEndPntConfigCallAgentUdpPort [09] = 2427
pktcNcsEndPntConfigCallAgentUdpPort [10] = 2427
pktcSigDefNcsReceiveUdpPort [00] = 2427
snmpCommunityName [mtaprov] = 0x70 0x75 0x62 0x6c 0x69 0x63
snmpCommunitySecurityName [mtaprov] = @mtaprov
snmpCommunityStorageType [mtaprov] = 02
snmpCommunityStatus [mtaprov] = 04
btiTALineAutonomousOSIEnable [01] = 02

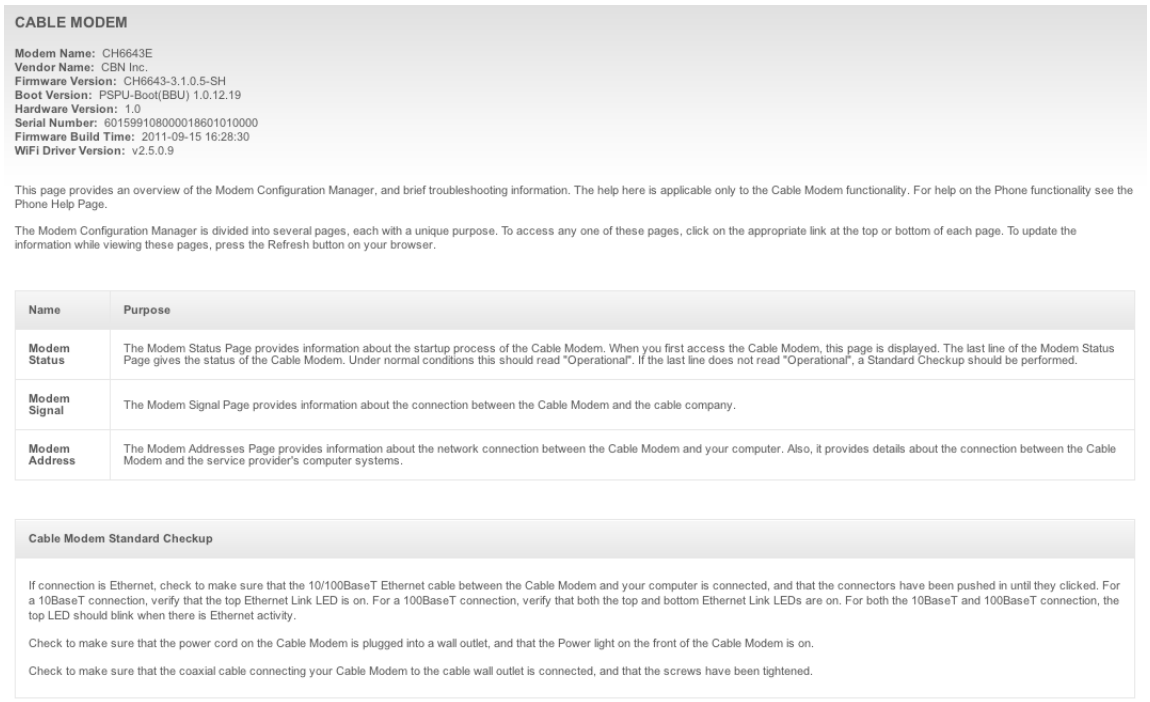
# 11 HELP Pages

Click any HELP submenu option to view the status information for that option.




## HELP Cable Modem Page

This page provides some important and useful information about CH6643E, including modem name, firmware version, serial number and Wi-Fi driver version.


CABLE MODEM
Modem Name: CH6643E
Vendor Name: CBN Inc.
Firmware Version: CH6643-3.1.0.5-SH
Boot Version: PSPU-Boot(BBU) 1.0.12.19
Hardware Version: 1.0
Serial Number: 60159910800001860101000O
Firmware Build Time: 2011-09-15 16:28:30
WiFi Driver Version: v2.5.0.9
This page provides an overview of the Modem Configuration Manager, and brief troubleshooting information. The help here is applicable only to the Cable Modem functionality. For help on the Phone functionality see the Phone Help Page.
The Modem Configuration Manager is divided into several pages, each with a unique purpose. To access any one of these pages, click on the appropriate link at the top or bottom of each page. To update the information while viewing these pages, press the Refresh button on your browser.
Name
Purpose
Modem Status
The Modem Status Page provides information about the startup process of the Cable Modem. When you first access the Cable Modem, this page is displayed. The last line of the Modem Status Page gives the status of the Cable Modem. Under normal conditions this should read "Operational". If the last line does not read "Operational", a Standard Checkup should be performed.
Modem Signal
The Modem Signal Page provides information about the connection between the Cable Modem and the cable company.
Modem Address
The Modem Addresses Page provides information about the network connection between the Cable Modem and your computer. Also, it provides details about the connection between the Cable Modem and the service provider's computer systems.
Cable Modem Standard Checkup
If connection is Ethernet, check to make sure that the 10/100BaseT Ethernet cable between the Cable Modem and your computer is connected, and that the connectors have been pushed in until they clicked. For a 10BaseT connection, verify that the top Ethernet Link LED is on. For a 100BaseT connection, verify that both the top and bottom Ethernet Link LEDs are on. For both the 10BaseT and 100BaseT connection, the top LED should blink when there is Ethernet activity.
Check to make sure that the power cord on the Cable Modem is plugged into a wall outlet, and that the Power light on the front of the Cable Modem is on.
Check to make sure that the coaxial cable connecting your Cable Modem to the cable wall outlet is connected, and that the screws have been tightened.

## HELP Telephone Page

This page provides the brief description of TELEPHONE submenu and the standard checkup procedure.

## TELEPHONE

**Modem Name:** CH6643E
**Vendor Name:** CBN Inc.
**Firmware Version:** CH6643-3.1.0.5-SH
**Boot Version:** PSPU-Boot(BBU) 1.0.12.19
**Hardware Version:** 1.0
**Serial Number:** 60159910800001860101000O
**Firmware Build Time:** 2011-09-15 16:28:30
**WiFi Driver Version:** v2.5.0.9

This page provides an overview of the Modem Configuration Manager, and brief troubleshooting information. The help here is applicable only to the Telephone functionality. For help on the Cable Modem functionality see the Modem Help Page.

The Phone Configuration Manager is divided into several pages, each with a unique purpose. To access any one of these pages, click on the appropriate link at the top or bottom of each page. To update the information while viewing these pages, press the Refresh button on your browser.

| Name | Purpose |
|---|---|
| **Phone Chau** | The Phone Status Page provides information about the startup process of the MTA. |
| **Phone Provisioning** | The Phone Provisioning Page provides information used to establish a phone link between the MTA and the phone service provider. The phone feature of the MTA is operational only when the provisioning has been successful. |
| **Phone Configuration** | The Configuration Page provides information about the current configuration of the phone lines. |

### Phone Line Standard Checkup

Please consult the MTA User Guide for additional information.

Check to make sure that the Send, Receive, and Online lights on the front of the Cable Modem are on or blinking. If the lights are off and do not blink, reboot the modem by disconnecting and reconnecting the power plug in the back of the modem.

Check to make sure that the phone lines are properly connected between the phone and phones jacks in the back of the MTA.

Check to make sure that Cable Modem service is operational. See the Modem Help page for further details. The phone service will be available only when the Modem is fully operational.

# 12 Troubleshooting

If the solutions listed here do not solve your problem, contact your service provider.

Before calling your service provider, try pressing the Reset button on the rear panel of the CH6643E. Please note, if you press the Reset button, you will lose all your custom configuration settings, including Firewall and Advanced settings. Your service provider may ask for the front panel LED status; see Front-Panel LEDs and Error Conditions.

## Solutions

**Table 1 – Troubleshooting Solutions**

| Problem | Possible Solution |
|---|---|
| **Power light is off** | Check that the CH6643E is properly plugged into the electrical outlet.<br>Check that the electrical outlet is working.<br>Press the **Power On/Off** button of CH6643E. |
| **Cannot send or receive data** | On the front panel, note the status of the LEDs and refer to Front-Panel LEDs and Error Conditions to identify the error. If you have cable TV, check that the TV is working and the picture is clear. If you cannot receive regular TV channels, the data service will not function.<br>Check the coaxial cable at the CH6643E and wall outlet. Hand-tighten, if necessary.<br>Check the IP address.<br>Check that the Ethernet cable is properly connected to the CH6643E and the computer.<br>If a device is connected via the Ethernet port, verify connectivity by checking the LINK LEDs on the rear panel. |
| **Wireless client(s) cannot send or receive data** | Perform the first four checks in “Cannot send or receive data.”<br>Check the Security Mode setting on the Wireless Security Page:<br>• If you enabled WPA and configured a passphrase on the CH6643E, be sure each affected wireless client has the identical passphrase. If this does not solve the problem, check whether the wireless client supports WPA.<br>• If you enabled WEP and configured a key on the CH6643E, be sure each affected wireless client has the identical WEP key. If this does not solve the problem, check whether the client’s wireless adapter supports the type of WEP key configured on the CH6643E.<br>• To temporarily eliminate the Security Mode as a potential issue, disable security.<br><br>After resolving your problem, be sure to re-enable wireless security.<br>• On the Wireless Access Control Page, be sure the MAC address for each affected wireless client is correctly listed. |
| **Slow wireless transmission speed with WPA enabled** | On the Wireless Primary Network Page, check whether the WPA Encryption type is TKIP. If all of your wireless clients support AES, change the WPA Encryption to AES. |

# Front-Panel LEDs and Error Conditions

The CH6643E front panel LEDs provide status information for the following error conditions:

**Table 2 – Front-Panel LEDs and Error Conditions**

| LED | Status | if, During Startup: | if, During Normal Operation: |
|---|---|---|---|
| **POWER** | OFF | CH6643E is not properly plugged into the power outlet | The CH6643E is unplugged |
| **RECEIVE** | FLASHING | Downstream receive channel cannot be acquired | The downstream channel is lost |
| **SEND** | FLASHING | Upstream send channel cannot be acquired | The upstream channel is lost |
| **ONLINE** | FLASHING | IP registration is unsuccessful | The IP registration is lost |